TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

COVER: Overhead signs on New Jersey's dual-dual highway (U. S. 1) leave no doubt as to proper route to take. For comment on other signs see this month's editorial. (Photo courtesy Public Roads Administration.)

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Entered as second class matter November 7, 1941, at the Post Office at Plainfield, New Jersey under Act of March 3, 1879.

TRAFFIC ENGINEERING is published monthly by the Institute of Traffic Engineers at 400 Watchung Avenue, Plainfield, New Jersey. Editorial Offices, 2312 North Vernon, Arlington, Virginia. Business Office, Strathcona Hall, New Haven 11, Connecticut. Permission to reprint contents with customary credit line is given unless otherwise stated.

Single copies 20c, subscription price $2.00 per year in the United States. Other publications of the Institute of Traffic Engineers include the Annual Proceedings, and Traffic Engineering Handbook.

VOLUME XVIII **JUNE, 1948** **NUMBER 9**

Frankly Speaking

MT, NTB, QMT, LT, LT with arrow, NP.

Not the chant of a tobacco auctioneer, but symbols for signs for New York City proposed recently by the Borough President of Manhattan, who contends that "simplified and standardized street signs would add to the beauty of the city and increase fluidity of traffic".

Literal translation of the symbols is: MT, merging traffic; NTB, no trucks or buses allowed; QMT, Queens Midtown tunnel; LT, left turn on red signal; LT with arrow, Lincoln tunnel; NP, no parking.

It is difficult to visualize how these proposed signs could benefit those motorists who need the most assistance—visitors to New York City. If, on the other hand, our existing standard signs are so inadequate as to prompt a suggestion of this type from a high city official in New York, it is about time that our sign manual be re-examined in order to determine its adequacy in specialized instances like this. We have progressed at a rapid pace in obtaining uniformity. There can be no exceptions if standardization is to be achieved.

Robert O. Swain

Editor

Turnpike Economics

by R. N. BERGENDOFF

Editor's Note: TRAFFIC ENGINEERING *magazine has previously published the case against toll. The following article for toll roads was prepared by Mr. Bergendoff of Howard, Needles, Tammen and Bergendoff, consulting engineers for the Maine Turnpike.*

IN THE last few years numerous articles and editorials have appeared in the technical and daily press which indicate the controversy that has arisen over the question of toll roads. When one realizes, as shown by a recent survey, that of the 3,300,000 miles of roads and streets in the United States there are only 25 motor vehicle toll roads totaling 346.6 miles in length, it may appear surprising that such a furor could be raised on this question. Included in this toll road mileage is the 160.7 miles of the Pennsylvania Turnpike, constituting 46% of the total. Clearly other reasons than what has been done in the past are causing the controversy over toll roads.

It is only necessary to consider the state of our road system today to realize why such a controversy exists. Highway authorities have reported that 60,000 miles of our primary roads are obsolete, that twenty-two billion dollars will be needed to bring the country's 600,000 mile federal-aid highway system alone up to the desired standard. Faced by such figures the question arises "Where is the money coming from?" March 15th is a date fresh in our minds reminding us that we are still paying on debts which will take many years to clear.

"Out of the Mud"

Most of us remember the first highway problems in our respective states: the days when the goal was to get out of the mud. Even then we asked, "Where was the money coming from to complete a system of all weather roads?" Particularly puzzling was the question of providing expensive bridges across major streams, structures which in individual cases cost more than many miles of road. The record of twenty-five years shows how many of these structures were built, independently of highway funds, with private capital as toll bridges, with the user paying the bill.

Naturally as one looks over this record the question also arises, if we solved the expensive bridge crossing on a user pay basis, is it not possible to finance many badly needed highways and expressways on the same basis. There are those who say it is possible and practical and that it provides a solution to care for immediate needs. Then again there are those who disagree. The toll road controversy, therefore, deals primarily with future policy. Opponents claim that the chief danger of toll highways is that a toll route breeds toll routes. Proponents agree that no one wants a toll road but that if we are to be realistic in our thinking, a toll road now adequately providing for traffic is much to be preferred over a crowded obsolete road endangering the lives of those who travel over it.

List Toll Facilities

Surveys show that there are now 25 motor vehicle toll roads, 240 toll bridges, six pay-as-you-enter tunnels and 561 ferries operating in the United States. The Wilbur Cross Parkway, 2.15 miles in length, is the shortest public toll road. The 235.3 miles of public toll roads are all interstate, while other toll facilities, bridges, ferries and tunnels are in many cases international as well as interstate. Four states, Arizona, Nevada, New Mexico and Utah, have

no toll facilities of any kind. Eight states, Delaware, Idaho, Indiana, Iowa, Kansas, Minnesota, Nebraska and Wisconsin, have no intrastate but one or more interstate toll facilities. Kentucky leads the nation with 128 toll facilities, all bridges and ferries. New York is second with 78 and Illinois third with 62.

Possibly one of the greatest misnomers is the term, "free road". We all know there is no such thing as a "free" road. A road is an improvement which costs money. Compared to a toll road it is merely paid for in a different manner. Every time that we drive into a filling station for gas we pay a toll. A toll road has been defined as a road on which all users are charged a toll, which in addition to covering operating cost is intended to liquidate the bond issue to cover initial cost. In one case a general tax is used to pay the cost and in the other, the user pays the cost. It resolves itself into a choice of method of levying a tax. Colbert is supposed to have said, with typical French cynicism, "The art of taxation consists in so plucking the goose as to obtain the largest amount of feathers with the least possible amount of hissing". Clearly no one wants a toll road if ways could be devised to have others pay for the roads on which we ride. There should be no question that proponents and opponents both are in agreement that it would be preferable to have so called "free" roads.

The first toll road attracting nation wide attention was the Pennsylvania Turnpike. Built in the late 30's it has been an inspiration to highway planners. Of dual lane construction, limited access, flat grades and curves, traffic moves easily and quickly without interruption over the length of 161 miles. Opponents of toll roads, however, refuse to acknowledge the Pennsylvania Turnpike as a fair example of toll road construction, inasmuch as 45% of its cost was contributed by the government as a PWA grant. The fact that the gross receipts for the year 1947 were around $4,000,000 should indicate that the total construction cost of $70,000,000 could be readily amortized in an acceptable period with the traffic the Turnpike now carries.

A network of main international highways for truck transport was tentatively designed by the Inland Transport Committee of the Economic Commission for Europe meeting in Geneva in April for the Western European countries of Belgium, Denmark, France, Italy, Netherlands, Sweden, Switzerland, and Bizonal Germany.

Routes selected for the international system include much of Germany's autobahn and some of the better national highways of the other countries together with projected roads yet to be constructed.

Privately Financed

The first major toll road to be 100% privately financed with the user to pay all the cost is the first section of the Maine Turnpike. This is a 47 mile controlled access superhighway extending from the southern boundary of Maine at Kittery to Portland.

Legislation for a toll road was enacted by the legislature of the State of Maine on April 17, 1941. This Act created an Authority, a body corporate and politic, empowered to construct, maintain and operate a Turnpike from Kittery at a point near the southern boundary to Fort Kent at the northern boundary of Maine, a distance of some 450 miles. Aside from preliminary surveys, and traffic

and engineering studies by the State Highway Department nothing in the way of substantial progress could be accomplished during World War II. Such work as could be done was carried out with funds loaned to the Authority. The Turnpike, therefore, was looked upon as a postwar project to be undertaken promptly upon the conclusion of the war. In the late summer of 1945 investment bankers, bond council and consulting engineers were engaged. In the fall of 1945 surveys and traffic studies were carried out and in January 1946 a preliminary engineering report and a revised traffic report were completed for financing purposes.

A limited construction period was most desirable in order to keep to a minimum the interest charges during this construction period and to produce revenue as soon as possible through toll collections. A two-year construction program was adopted, with grading pushed during the first working season and paving completed during the second working season. Bridges and similar structures were started during the first and completed during the second working seasons.

Dual Highway

The first section of the Maine Turnpike is a dual highway of two 24 ft. wide paved roadways separated by a 26 ft. median strip. Dual pavements are maintained at 50 ft. centers throughout the length of the Turnpike. Outside shoulders are 10 ft. wide, inside shoulders 4 ft. wide. Grade separation structures are provided at all intersecting roads and railroads. Access is at the terminals and at four intermediate points located about 11 miles apart. There are eight bridges and thirty-five grade separation structures in this section. The longest bridge at Saco is 620 ft. At all crossings carrying the Turnpike, dual structures provide a separate bridge for each roadway. Right-of-way is a minimum 300 ft., maximum curvature 1°, minimum site distance 525 ft., minimum vertical clearance 14 ft. Roadway pavements are 7 ins. to 8 ins. in thickness, hot mix asphaltic concrete laid on a selected permeable non-frost heaving subgrade material varying from 2 ft. to 4 ft. in thickness.

Opponents of toll roads have questioned the justification of the Maine Turnpike. In many cases their criticism reflects an adamant attitude. They are just dead set "agin toll roads". The staggering amounts needed to modernize our highway system should cause us to be realistic in our thinking. Again we ask, "Where is the twenty-two billion dollars coming from?" Are the opponents of toll roads justified in demanding that we have "free roads", or else no roads, when expressways are so badly needed to relieve traffic congestion which threatens to become worse in the near future? Without going into all the arguments advanced for and against toll roads, the position taken by the American Automobile Association, commonly known as the AAA, is of interest. The Association has consistently taken a stand against toll roads.

The economic aspects of the Maine Turnpike can be best fully explained by applying the criteria set up by the American Automobile Association in their policy concerning toll roads, adopted at their 45th annual meeting in Washington, D. C. The Association adopted eight points which should be satisfied before it considered a toll road to be justified. Let us see how the Maine Turnpike meets these criteria, taking up one point at a time.

> Criterion 1: "No toll road project should be authorized unless it be demonstrated that the road is essential from the

> viewpoint of public convenience and necessity and that there is no possible way in which it may be constructed without current or contemplated tax programs".

The State Highway System of Maine totals about 9,400 miles. For the years 1942-1945 the Commission spent $19,000,000 for maintenance and $4,700,000 for construction. The first section of the Maine Turnpike, 47 miles in length, cost $20,000,000. It would have taken four years funds of the Highway Department to build this one section alone. Need one ask what chance there would have been to build a comparable free road with highway funds? A trip along Highway No. 1 during the summer months would quickly convince one of the necessity for traffic relief. 18,000 and 20,000 vehicles a day resulted in long lines of two lane traffic through main streets of the numerous cities through which Highway No. 1 is routed. Bottlenecks caused by these narrow streets had for years created traffic congestion and problems. Delays of hours were frequent to pass traffic light intersections. Tourists streaming into the state from the south had practically no other choice than to use Highway No. 1 as the Highway System of Maine fans out from Portland as a hub. Attempts had been made to widen U. S. Highway No. 1 between Kittery and Portland as funds permitted. As a result the highway varied from 2 to 4 lanes in width. In this length there are 76 highway intersections. Because of expensive right-of-way no definite pattern had been followed in the widening programs, resulting in many dangerous and hazardous stretches of road. The problems of this congested road were no different from other congested highways over the country. Accidents, loss of life, property damage, delays, confusion, all demanding something should be done. From the standpoint of public convenience there was no question a new road was needed. To propose use of current contemplated taxes for the purpose of financing such a road was not considered even by the most optimistic road enthusiast.

The Inter-Industry Highway Safety Committee, which has begun distribution of its new film, "In The Driver's Seat," has announced that 16 mm. sound prints of the film may be purchased at $37.50 each, plus postage. Orders are to be sent to the Committee's national headquarters, 1026 Seventeenth Street, N.W., Washington, D. C.

> Criterion 2: "There shall be a study which clearly establishes the economical justification of the proposed toll road."

Revenue bonds have, for a number of years, provided the means of obtaining funds for public improvement projects. The market for these bonds has become so competitive that financing costs are comparatively low. The bonds are attractive to investors in that the majority of issues are exempt from income tax assessment. The record of this type of financing in the toll bridge field has been remarkably free of default largely attributable to the insistance of purchasing syndicates that the projects shall be economically sound. As a result a bond issue, such as for the Maine Turnpike cannot be sold until a comprehensive traffic report based on traffic surveys has been made by nationally recognized traffic engineers. In conducting these surveys all available traffic records are analyzed. Origin and destination surveys are made of existing traffic and the diverted and the induced traffic on the proposed facility are estimated for a period of the term of the bonds. Twenty to twenty-five years experi-

ence has produced many facts concerning trends of traffic and the diversion of traffic to improve avenues of travel. These facts coupled with a realization of the working of the law of diminishing returns in setting toll schedules has permitted the traffic engineer to estimate traffic on proposed toll projects with considerable accuracy.

Reputations of traffic engineers engaged in making such reports have been established by the accuracy of their prognostications. One of the first steps taken on the Maine Turnpike was the retaining of a nationally recognized firm of traffic engineers whose report would be acceptable to all investment bankers interested in the purchase of the bonds. A favorable report was rendered by the traffic engineers retained for this purpose thus completing an important step in the necessary sequence of steps to be taken before the project became a reality. The report showed the south section of 47 miles to be economically justified.

> Criterion 3: "The proposed toll road shall not be located on an existing public highway, that is, a new right-of-way shall be acquired".

In locating the Maine Turnpike there was no other choice than to acquire a new right-of-way. The only existing road was U. S. #1, a public highway, with limitations as previously described. With power of condemnation, the Turnpike Authority was in position to acquire, after paying a fair price, the required right-of-way strip 300 ft. wide. The alignment parallels U. S. #1 at a distance varying from one to five miles. In acquisition of the right-of-way the problems compared with those of any public highway improvement except that the access to the road was limited to points of intersection. Cross roads had to necessarily be carried over the Turnpike since access to the toll road was limited to points of interchange where toll collection facilities were established. In some cases slight relocation of cross roads combined two roads to use a single overpass. Thirty-four road overpasses were provided in the length of 47 miles to carry cross roads over the Turnpike without giving access thereto. Right-of-way cost, including agents and legal fees, averaged $15,000 a mile.

> Criterion 4: "The plans, location, alignment and standard of construction shall meet the approval of the State Highway Department".

The Enabling Act provided that the Authority should include as ex-officio member the Chairman of the State Highway Commission. The Chief Engineer of the Highway Commission was elected to serve as Secretary and Treasurer of the Authority. The Act further provided that all contracts should be approved by the Highway Commission. Throughout the planning and construction of the project, the Turnpike Authority worked closely with the Highway Department. Prior to employment of the Consulting Engineers, engaged to design and supervise construction, the Highway Department had determined an alignment for the road which was finally adopted with minor changes. The project was designed to meet all requirements of Interregional Road Standards.

> Criterion 5: "The ownership, construction and operation shall be vested in a public authority or other governmental agency".

In the light of early toll road and toll bridge history the reason for this most desirable criterion becomes quite evident. Early toll bridges were controlled and financed with private capital. As a result, as the saying goes, "There was sometimes more water in the stock than under the bridge". Public opinion became justly aroused and antagonistic toward toll bridges. Public funds were being used to pave public highways up to these structures and private individuals and corporations were exacting a toll at the bridge. The real objection lay in the granting of franchises with no provisions made for freeing the structure after their cost had once been paid. As a result, franchises for toll bridges can now only be obtained by public bodies. Similarly turnpike enabling legislation as passed in recent years by State legislature vests ownership, construction and operation in public authorities and governmental agencies. The Maine Turnpike Authority created by an Enabling Act of 1941 consists of five members serving without pay receiving only reimbursement of necessary expenses incurred in the performance of their duties. The members of the Authority are appointed by the Governor.

> Criterion 6: "The credit of the State, or any political subdivision thereof shall not be pledged as security for any outstanding or future obligations as for right-of-way, construction or operation. No toll road shall under any circumstances receive public tax funds for right-of-way, construction or maintenance".

As previously stated, bonds totaling $20,000 were issued to obtain funds for construction of the first section of the Maine Turnpike. These are revenue bonds. Neither the credit of the State nor of any political subdivision thereof, is in any manner pledged as security for these bonds. If revenues from the project prove insufficient to service the bonds, there is no recourse to tax funds. The bond holder in purchasing the bonds acknowledges only the tolls of the users of the Turnpike will be available to pay operation and maintenance costs, the bond interest and to retire the bonds. It is of interest to note that the indenture securing the bonds does not provide a mortgage on the physical property but merely a lien on the net revenue derived from a toll charge for passage over the highway. In case of default the bond holder cannot obtain title to the Turnpike. The Turnpike remains the property of the Authority.

This particular phase of financing is in-

(See MAINE *on page 446)*

GREATEST ROAD BUILDING ERA COMING

What may perhaps be the nation's greatest road building and improvement era lies ahead, the Second Highway Transportation Congress which met recently in Washington under sponsorship of the National Highway Users Conference was told.

Among those predicting a great volume of road and street improvement were the new chairman of the Automotive Safety Foundation, Alexander Fraser, and G. Donald Kennedy, vice-president of the same organization.

But they, and other speakers, warned that this time the expansion and modernization of the nation's road network must be carefully planned in the light of the public's ability to pay.

Caution Urged

Mr. Fraser scored the "let's build roads and forget the cost" attitude which he said seemed to be taken by some sections of the public, and praised highway departments for not "plunging headlong" into road construction in the face of manpower and material shortages and inflation costs.

This necessity of examining road plans in the light of general conditions was also mentioned by Alfred P. Sloan, retiring chairman of the National Highway Users Conference, in his keynote address to the Congress.

He said an adequate highway system at lowest possible cost was "fundamental" to national progress, but said highway transportation problems were inseparable from other national problems.

He declared that the demands of highway transportation upon the nation's economic system as a whole "should be based upon the most careful appraisal of our needs." He asked for a statesmanlike approach to the nation's highway problems.

Cite Military Usage

Another speaker at the Congress, Arthur M. Hill, chairman of the National Security Resources Board, told the conference that the highway system which met the burdens of World War II may not be necessarily adequate for the burdens of a future war. He noted that recent wartime experience has proved that highways which adequately serve peacetime needs will also be a valuable resource in time of war.

Mr. Hill described the proposed 40,000-mile Interstate Highway System as one in which his board, composed of cabinet members, has a "vital interest." He asked:

"Is this great project, designed to blast pathways through urban congestion and other bottlenecks, proceeding with sufficient speed? Are there national, state or local road policies which need revision in order to expedite the construction of this great system? Should we give consideration to special Federal contributions to sections of the route where peacetime traffic may be light but wartime traffic may be heavy?

Planning Needed

The contention that sound highway planning cannot be done without sound financial planning was voiced by Baird H. Markham, director of the National Petroleum Industries Committee, who said existing abuses, such as diversion and dispersion, must be corrected as a first step to highway progress.

The Congress itself demanded that

Federal Aid be completely withheld from those states which still divert their own road funds while receiving additional road funds from the national government.

In another recommendation, the Congress urged that toll roads be barred from the Federal Aid system.

The problem of metropolitan traffic congestion brought out two different approaches by Congress speakers. Park H. Martin, Pittsburgh (Pa.) planning expert, said limited-access city highways are the "ultimate answer" to the need for free movement of large volumes of fast traffic. John V. Lawrence, managing director of the American Trucking Associations, Inc., said that while expressways could skirt congestion, one cure for congestion was modernization of vehicle loading and unloading facilities by business and industry. He also suggested the desirability of businesses which do not need central locations moving out into less congested areas.

OPINION REPORTS ARE CONSOLIDATED

Due to the continuing demand for two of its reports on traffic, Future Springfield, Inc. has consolidated the reports. The new report, known as the Consolidated Traffic Report (including the Public Opinion Poll on the Traffic Problem), is a combination of the Traffic Survey published in late 1946 and the Public's Opinion on the Traffic Problem published in mid 1947. Pictures used in the original reports have been eliminated but basic text and charts have been retained.

The report, spiral bound, carries the usual Future Springfield touches of easy readability and simple style. It has been redesigned and priced at fifty cents per copy. Special quantity prices are available on application.

LOS ANGELES HOLDS PLANNING CONFERENCE

by MARGARET WOOLVERTON

A Highway Planning Conference was held recently at the University of California at Los Angeles under the sponsorship of the Institute of Transportation and Traffic Engineering and the Department of Engineering of the University of California. The chairman of the meeting was E. D. Howe, Acting Director, Institute of Transportation and Traffic Engineering and Acting Dean, College of Engineering, Berkeley. Local arrangements were handled by Professor J. H. Mathewson. Several ITE members were in attendance.

At the morning session, Roy J. Jorgensen, Deputy Commissioner and Chief Engineer, Connecticut State Highway Department, spoke on "Some Aspects of Highway Planning".

In the afternoon there was a panel discussion and open forum on "Highway Planning Criteria and Objectives". The panel leader was Professor Mathewson. Members of the panel were: N. F. McCoy, Principal Highway Engineer, U. S. Public Roads Administration, San Francisco; Harrison R. Baker, Member, California State Highway Commission, Pasadena; John Commons, Research Engineer, Regional Planning Commission, Los Angeles County; Charles B. Bennett, Director of Planning, City of Los Angeles; N. W. Reese, Planning Engineer, District VII, California Division of Highways, Los Angeles. A similar conference was also held in Berkeley.

A Department of Research has been created in the national office of The Associated General Contractors of America.

The Traffic Problem in Sao Paulo

by DR. LAURO DE BARROS SICILIANO

Editor's Note: This is a translation of a lecture given by Dr. Lauro de Barros Siciliano. L. Gonzalez Soler, student at Yale Traffic Bureau, made the translation. The lecture was given at the Rotary Club in Sao Paulo, Brazil. It is reproduced here to show the consideration given traffic in other countries.

Dr. Lauro de Barros Siciliano is a Civil Engineer from the Mackenzie Engineering School, President of the Division of Transportation and Traffic, of the Engineering Institute. He is the son of the late Heribaldo Siciliano, who was a member of the Rotary International for ten years and President for the period December 1930 to June 1931 of the Sao Paulo Club.

WHAT is usually called the *traffic problem* in the big cities is related to three problems, as follows:

a. Flowing facilities for public and private vehicles, as well as for pedestrians.
b. Reduction of accident rates on public roads.
c. Good transit service for the masses.

On the other hand, it must also be kept in mind that there are economic factors in this problem. Such things as accidents, excessive number of vehicles and of motorists on the highways, loss of time, property damages, insurance, etc., involve large amounts of money lost or spent.

The traffic in Sao Paulo is on a par with that of other large cities in the world and to add to the already existing confusion, caused by the movement (or paralysis!) of vehicles and pedestrians, there is also the confusion created by certain "specialists", especially those who write in our newspapers.

The attitude of Rotary International in expressing its solidarity with the Engineering Institute for the purpose of turning the jurisdiction of traffic over to the municipal government has been much appreciated. The Sociedade Amigos da Cidade (Society of Friends of the City) has also expressed its affinity to this program.

More Engineering

When it is stated that the traffic problem is more one of engineering than of policing, a true statement is being made, because the orderly movement of vehicles and pedestrians follows certain laws which must be well known so that such movement may be as free as possible.

To a certain extent, such movement may be compared to the flow of fluid along pipelines: these fluids, like the vehicles, are subject to certain frictions and difficulties such as curves, ramps, intersections, etc., which cause what is called "load loss". Once such losses are known, it is easy to regulate the flow.

I am certainly going to disappoint many of those present when I state that I do not have any solution to the case of Largo Sao Francisco (note by translator: a Largo in Brazil is usually a square or garden-type island in a street), nor do I have any solution for any similar problems. I confess I do not know how to solve such problems. What I do state with certainty is that a great general traffic census is necessary for the solution of the traffic problems, since that is the only way to know the causes of the problem. In 1940 the Prefecture made a very good census of traffic in Sao Paulo, bearing in mind the transit of the

masses; that work, which was published, should be continued, or better still, brought up to date. With such specific data as quantity and kind of vehicles which move towards the center of town, their respective number of passengers, their destination and origin, etc., it is possible to project a good transportation plan. Such type of planning, together with the planning of a city, is what constitutes *Traffic Engineering*, a specialization which has already been introduced in many American universities. Let us now see a typical case of this technique applied to traffic. The flow or capacity of a street depends on the number of vehicles which travel through it in a determined space of time. This capacity depends, therefore, on the characteristics of the street in question, such as width, layout, grade, paving, etc., as well as on the speed (average) and type of vehicles, the time of traffic, etc.

Street Capacity

It has been observed that in the peak hours, the capacity of a street is higher at a certain speed, which is noticeably slower than that which is normally taken during normal hours of traffic. This means that, starting from that hour, the vehicles which travel along that route should maintain the established speed in order that the flow of traffic be as good as possible.

Another example: when in a certain route or street there is any diminution in the width of the traffic lane, it is necessary to increase the speed in that section in the proportion of the narrowing of the street. The engineers know that this fact is related to the theorem of Bernoulli, but the policemen are not required to know these things and for that reason they almost always issue orders to have signs put up at the entrance of tunnels, exactly where the traffic becomes congested, requesting that the vehicles slow down. The result is mathematical: congestion.

Another false concept defended by many newspapermen who write on the problems of city planning and traffic and even on certain subjects related directly to that service is that of the congestion of traffic in the centers of the towns. They state that the street cars and buses really constitute impediments and that they should be withdrawn from the central points; such is pure falacy. What we must without delay abolish from the center of the city is precisely the passenger car, which as means of transportation, do not render the best service. It may be affirmed with certainty that a passenger car in Sao Paulo transports at best an average of two persons each, which means that each person who travels in a car occupies, on the average, 5 square meters of road surface. In the case of a bus, that surface is reduced to less than 1.2 square meters.

Flexible Transport

Obviously the tendency should be to substitute street cars for buses in the immediate center of the city, since the latter are more manageable. But to abolish collective vehicles in favor of passenger cars is an outrage. The "Circular" line demonstrated this fact conclusively. It was necessary to have a large number of passenger cars to substitute the number of buses withdrawn and one of the consequences of such action was the increase of congestion, not to mention the increase in the price of transportation.

A great American author, Mr. McClintock, states that in traffic matters one should follow the rule of the three E's: Engineering, Education, Enforcement. In Sao Paulo there has only existed Enforcement which, unfortunately, has been much reduced lately.

Such policing action, universally adopted, resulted from the lack of

knowledge of the problem in the beginnings of motorized traffic, when automobiles became a public menace. Later automobiles became indispensable, and the increase in its numbers was so considerable that it created the traffic problem.

For the solution of that problem it is necessary to have the assistance of the technique already mentioned. In some American cities traffic continues to be regulated by the police, but the tendency is to turn it over to the municipal engineering department.

Stress Education

The educational part of the program is of great importance and here too there should be technical guidance. It is necessary for the pedestrian to learn how to cross a street or a square and how to walk correctly along paths; it is necessary that the motorist know his traffic lane, how to give signals, how to respect priorities, which is the safe speed, etc.

Now, in order not to take too long in this matter, which is vast and covers even philosophic discussions, I am going to make some comments.

By a simple observation of what happens with traffic one can make interesting deductions. One of them, which is strictly individual with me, is that the concept of freedom is being misused even in traffic. Each person does what he wants to do and walks as he feels like walking. There are those who write on their vehicles such expressions as: "Get out of the way", "I am hogging the road" . . . Others paste announcements on the windshields which obstruct about 25% of the visibility, forgetting that automobile manufacturers have spent millions of dollars changing the makeup of automobiles in order to increase such visibility. Others hang from the rear-view mirror such things as good luck charms (monkeys and similar), dolls, or any other fanciful objects, which only serve to obstruct the view and irritate nervous people such as me. There are those who prefer colored lights and musical horns!

The Third Annual Report of the Motor Vehicle Fleet Supervisor Training Program, entitled "Increase Fleet Profits Through Fleet Supervisory Training," emphasizes the benefits derived from reduction of accidents through the training of supervisory personnel. It carries an outline of the standard training course scheduled this year at 27 colleges and universities. More than 3,100 fleet executives and supervisors, controlling more than 460,000 drivers, have attended these courses over the last three years.

"You Are Late"

And then, my dear friends, an accident happens and inevitably one hears the well known phrase: the motorist lost the sense of direction, etc., etc. The case is considered inevitable; it was that pedestrian's destiny that he should be killed, by that truck which carried the statement: "You are late!"

Some months ago I was badly struck by a truck which was traveling against traffic, and which had inscribed the following: "I do not like your face."

However, with respect to trucks which today constitute a veritable calamity one should make certain statements. This vehicle, due to its weight and dimensions, which renders a lesser visibility, is really dangerous and should, therefore, be driven by professional and selected persons. One sees in Sao Paulo gigantic trucks being driven by irresponsible youths, who generally come from the interior of the country and do not know anything about traffic and much less about their

responsibilities in the matter. Most of the blame, therefore, should be placed on the owners of such vehicles.

Brain Drives

It has been proven that an automobile is driven more by the brain than by the senses or the legs and arms.

One should also make some comments on accidents. The automotive disasters may be attributed to four principal factors, according to H. De Silva:

1. Lack of ability of the driver.
2. Lack of safety mindedness.
3. Excess speed.
4. Exposure to danger or risks.

It is very common among us to note always the excess speed as the principal cause of accidents, when in reality it is not. The sense of safety, or of preserving safety, which means respect for the life and property of the other man, is a very uncommon quality nowadays, especially among those terming themselves "expert drivers".

Taking risks is another factor which should be adequately considered. A truck, a bus, is really a vehicle for hire, and they are exposed to more risks than the private cars parked on Anhangabau . . . For that reason, its drivers should also be experts as well as conscientious. It is a well known fact that youths, even though they may drive with more ability and expertness, are less cautious and cause more accidents. It is necessary, therefore, that these factors be kept in mind when trying to solve the problem, for if not, all grave accidents will be taken as fatalities, will be considered inevitable accidents, "destiny", and such familiar phrases as those we see in the press like "the motorist lost control of the car, and . . . " This is a criminal phrase since it tries to cover up the real cause of the accident.

My dear friends, to finish, I want to thank Rotary International for asking me to say something about traffic. What I have said is the result of my personal observations during my 23 years as automobile driver, as well as of what I have read on the subject. I appeal to this organization to cooperate with those who wish to serve their communities, and I am sure that that cooperation will be worthwhile.

PHILADELPHIA PLANS NEW BOULEVARD

Plans for the construction of Pennsylvania Boulevard from Reyburn Plaza to 30th Street Station and beyond the station to Market Street at 32nd Street, have been approved by the Philadelphia City Planning Commission, Chairman Edward Hopkinson announced recently.

The new highway will be built after the Pennsylvania Railroad has constructed additional tracks and facilities on the lower level at 30th Street Station and at Broad Street Suburban Station to provide for handling the trains now using Old Broad Street Station, which will permit it to remove the "Chinese Wall." It is estimated that the entire project will require about five years to complete.

The Tenth National Institute for Traffic Training will be conducted July 5-23 at Northwestern University, Evanston, Ill., by the National Committee for Traffic Training, composed of leading organizations in the traffic safety field.

Transit-Freeway Combination

by W. J. McFadyn, *Secretary*
Metropolitan Traffic & Transit Committee,
Los Angeles Chamber of Commerce

Los Angeles is a rapid-transit-minded city these days.

Although Los Angeles has only surface street cars and buses to move the hundreds of thousands of commuters of her 2,000,000 city population and 4,000,000 metropolitan area population, her people are thinking in terms of downtown subways and speedy trains using freeway center strips.

Public transportation—forced to battle record automobile traffic and frequent traffic-signal delays — has been slowed to a crawl on most routes. Freeways, many of them several years in the future, will provide some relief, but not enough, in the opinion of traffic experts.

Past efforts to give the sprawling Los Angeles area modern transportation never got beyond the survey state—until the Los Angeles Chamber of Commerce decided the time was overdue for streamlining the county's interurban transit system.

C. S. Beesemyer, petroleum executive and 1947 president of the Chamber, delegated the Metropolitan Traffic and Transit Committee, under Chairman Neil Petree, to seek a rapid transit plan. Petree formed a subcommittee—the Rapid Transit Action Group, composed of leaders in transportation, engineering and finance—to tackle the job. LeRoy M. Edwards, vice-president and general manager, Pacific Lighting Corp., became chairman.

After five months of intensive new studies and review of previous surveys, the Rapid Transit Action Group came up with these suggestions:

1. Construct rail lines down the center of certain proposed automobile freeways to afford no-interference travel to most of the county's major cities.

2. Improve certain existing surface rights-of-way for faster travel by installing train-controlled traffic lights and overpasses, as well as possible lowered tracks in some communities.

3. Dig subways under two major downtown streets, Broadway and Hill, with connection to freeways and surface rights-of-way at the edge of the downtown area.

Engineers estimate the system could be built for $310,000,000, including cost of slightly wider rights-of-way for freeways, facilities and rolling stock, stations, signals and track.

Surveys indicated a probable patronage of 220,500,000 riders per year.

On this basis, it was proposed that fares should approximate 15 cents in the inner zone and 10 cents in each additional zone of about four miles.

The RTAG plan calls for creation of a transportation district, formation of which would be authorized by the State Legislature and approved by the voters. It would oversee final engineering of the system, its financing and construction. District directors would designate a company or companies to operate the rail lines and also buses, proposed for the less heavily patronized outer limits of the county-wide system.

Presentation of the plan to the public found enthusiastic acceptance by the press and many civic groups. Originators emphasized that the plan was little more than a skeleton program, capable of being revised in many details as unforseen situations might arise. Furthermore, the Rapid Transit

Action Group acknowledged that before any definite action were taken, the country's most competent engineers should be retained as consultants to check on their estimates and make any necessary changes.

Work of the RTAG was to recognize rails-on-freeways as the most economical and practical construction, subways as the best method of avoiding downtown congestion, improvements of rights-of-way as a device for utilizing direct, established routes.

To implement those findings, it was necessary to dig deeper into the problem and come up with estimates of cost, type of equipment, station layouts, subway pedestrian access facilities.

All are still in the form of recommendations. They may finally appear in much different form.

Progress toward establishment of a transportation district was temporarily delayed when the Los Angeles delegation of the State Legislature at a budget session declined to give rapid transit an "urgent" classification for immediate consideration. There is a possibility that, as a result, automobile freeway construction may proceed to a point where it will be impossible to allow for rails on some of the chosen routes. Time will tell.

The RTAG plan calls for two-car articulated units, which could be linked in multi-car trains. With stations to be spaced about a mile apart, engineers decided a 50-m.p.h. top speed would permit a 35-m.p.h. average speed and provide maximum efficiency of equipment operation and maintenance.

Unobstructed rail transit will cut travel time by as much as 54 minutes from Van Nuys (18 miles from downtown Los Angeles) to 10 minutes from Glendale (8 miles). Most savings would range from 23 to 40 minutes each way.

Financial estimates were that $49,379,000 should be provided for right-of-way, $222,414,000 for construction, excluding track but including stations; $27,892,000 for track, roadway and signals; and $10,000,000 for capital adjustment.

Patronage studies indicated 220,500,000 riders annually would return $59,150,000 in revenue. This was considered sufficient to finance the operating companies and bring the proposed district revenue for original bond retirement and interest.

The RTAG balance sheet was further broken down as follows:

Gross Passenger Revenue	$59,150,000
Less Revenue Collected for other operators supplying connecting services	7,700,000
	$51,450,000
Track Maintenance	$ 2,159,000
Equipment Maintenance	2,766,000
Power	1,750,000
Traffic	191,000
Transportation	8,430,000
Administration and Insurance	5,232,000
Depreciation and Amortization	11,092,000
Taxes	12,180,000
Operating rents (net)	2,000,000
Interest	5,650,000
TOTAL COSTS	$51,450,000

RTAG planners kept uppermost the desire of a self-supporting system that would require no tax funds for subsistence. The only tax expected would be a minimum levy of 5 cents per $100 assessed valuation for administrative expenses until revenues began accruing. District officials would require taxing authority for emergencies, however, but RTAG Chairman LeRoy M. Edwards pledged his committee had done and would do "everything possible to avoid any likelihood of rapid transit becoming a burden on the taxpayer."

Behind the engineers' thinking lay these facts:

Los Angeles has an average of one auto for two and one-half persons. The 4,000,000 population, growing at a rate estimated at 10,500 per month, will swell to around 6,000,000 in another dozen years.

Autos on three-lane freeways move a maximum of 7,000 persons per hour, figuring 1.7 passengers per car.

Buses, operating at 20-second intervals, can move about 10,000 persons per hour.

Rail trains can move about 30,000 per hour without adding to the volume of traffic on highways. In fact, rails-on-freeways would tend to reduce the number of present surface street cars and buses, allowing freer auto movement on city streets.

RTAG officials express the conviction that rails-on-freeways will help build up suburban areas by making it no longer necessary to live "close in" to places of employment; that added population will mean new community stores and services; that fast transportation, freeing the commuter of nerve-racking traffic, will be more economical than motoring and will divert thousands from the practice of driving to and from work.

An important feature is that rails could be put on freeways at lower expense and less upset of dwellings than if new rights of way had to be pushed through different areas under any nonfreeway plan. State highway builders have pledged their cooperation in the joint financing-engineering-construction details, according to Chairman Edwards.

Cost incident to rail construction would be paid wholly by district funds, with no use of state revenues already earmarked for freeway work.

A 1947 Award of Merit "for having rendered outstanding service to the industry which it represents as well as to the American public" has been presented to the Automotive Safety Foundation by the American Trade Executives.

Traffic counts made in Trenton show that the daylight hours have about two-thirds of the total traffic and the hours of darkness have one-third.

Night-time, with 33% of the traffic movement, had 63% of the fatal accidents.

The fatal night accidents were concentrated on the principal thoroughfares. Twenty-two miles of main streets had 65% of the night fatalities (51 out of a total of 78). These are the streets where adequate street lighting will be most effective.

In the 51 night fatal accidents on these principal thoroughfares, there were 43 pedestrians killed. These pedestrians ranged in age from 32 years to 84 years. Half of them were over 60 years old. The statements to the Police Department of drivers and witnesses show repeatedly that the drivers did not see the pedestrians in time to avoid the accident.

Adequate street lighting in accordance with the recommendations of the Illuminating Engineering Society, on the thoroughfare streets in Trenton can be expected to save three to five lives each year and also prevent many injury and property damage accidents.

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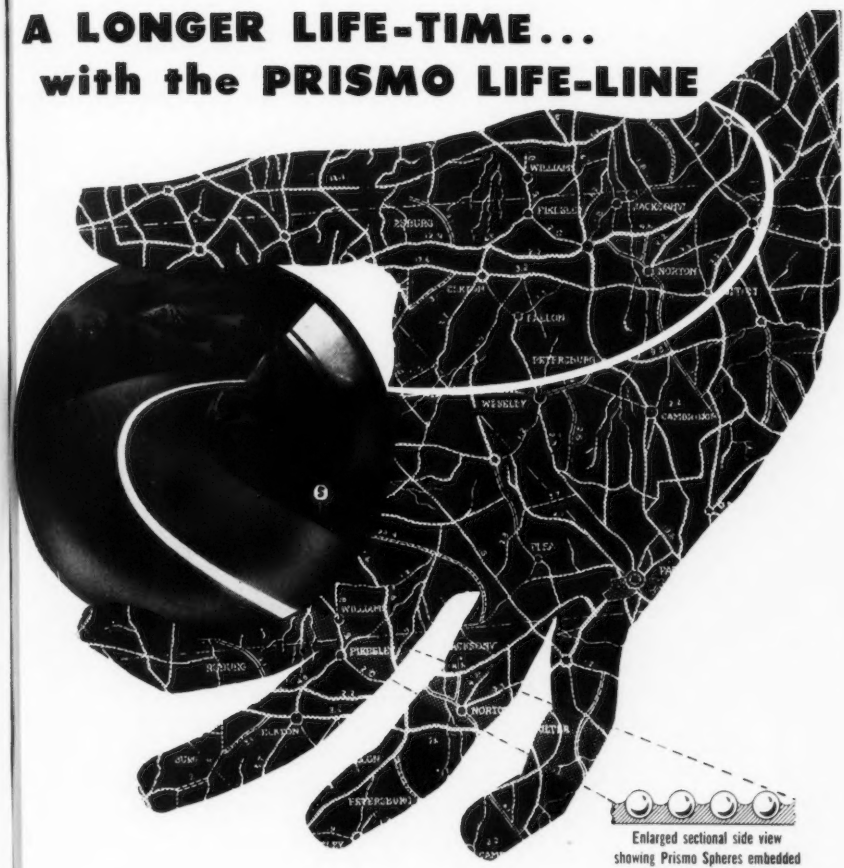

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NEW YORK TO USE TRAFFIC ENGINEERS

The State of New York has recently passed a law requiring traffic engineers to head local traffic agencies. The law, as signed by Gov. Dewey, follows.

AN ACT

To amend the general city law, in relation to the control of traffic.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Section twenty of the general city law is hereby amended by inserting a new subdivision therein, to be subdivision thirty-two, to read as follows:

32. To create by resolution of the local governing body a board, commission or department of traffic control in order to more effectively regulate and control vehicular and pedestrian traffic and better to serve the public convenience, promote public safety and to protect human life, health and property. Such a traffic agency shall consist of not less than five nor more than nine members who shall be appointed by the mayor. The chairman or head of such agency shall be a licensed professional engineer who shall have at least ten years' experience in traffic engineering. He shall also be the city traffic engineer and shall receive an annual salary. Such agency members shall include the commissioners of police and public works and the chairman of the city planning commission or the officials occupying analogous offices and one other qualified person and the mayor may designate other qualified city officers or employees to serve as members ex-officio and without additional compensation. Such traffic agency may contain within its departmental structure a bureau of traffic engineering, which bureau shall be under the immediate supervision of the city traffic engineer.

Wherever such a traffic agency shall be created as in this subdivision provided it shall, notwithstanding any other provision of law, possess exclusive power and authority within such city to (a) regulate, direct, restrict and otherwise to control the movement of vehicular and pedestrian traffic, (b) limit the size of vehicles, (c) determine the location of garages, parking lots and parking meters, (d) determine the design, type, size, method of erection, installation, removal, maintenance, operation and location of any and all signs, signals, markings, and similar devices for guiding, directing or otherwise regulating and controlling such traffic and, with approval of the local governing board, may relinquish for transfer and assignment to any other agency of the city government part or all of one or more such powers and duties, and (e) make rules and regulations for the conduct of vehicular and pedestrian traffic in the use of the public streets, squares and avenues as such board, commission or department may deem necessary. Such rules and regulations shall be filed with the city clerk and shall become effective when published in a paper published by the city or, if no paper be published by such city, in not less than three newspapers having a general daily circulation in such city. The violation of any provision of any such rule or regulation shall be triable by a city magistrate and punishable by imprisonment of not more than thirty days or by a fine of not more than fifty dollars or both.

Nothing in this subdivision contained shall effect or impair the powers or duties of the city planning commission or of any analogous agency of city government to determine the location of garages and parking lots or affect the power or duty imposed on the police department or other analogous agency to regulate hacks, taxicabs and taxi drivers pursuant to the provisions of any city charter, local law or ordinance and any such power and duty shall continue to be exercised and performed under the jurisdiction and control of such department or agency.

Upon the adoption of a resolution creating such a traffic agency, and except as in this subdivision otherwise provided, all of the functions, powers and duties vested in such traffic agency which therefore were exercised and performed by any other agency of the city government of such city, together with all records, property and equipment used in the exercise and performance of such functions, powers and duties shall, on the date fixed in such resolution, pass to and be in addition to the functions, powers and duties vested in such traffic agency by this subdivision.

2.a. It is the intent and purpose of this act, notwithstanding any other provision of law, to vest in any board, commission or department of traffic control created pursuant to subdivision thirty-two of section twenty of the general city law, exclusive power and authority to regulate, direct, control and restrict the movement of vehicular and pedestrian traffic within a city, to limit the size of vehicles used within such city, to determine the location of garages, parking lots and parking meters and to decide upon the type, placement and operation of such meters within such city and to make rules and regulations to effectuate such power and authority. It is the intention and purpose of this act, however, that the regulation of hacks, taxicabs and taxi drivers pursuant to the provisions of any city charter, local law or ordinance of such city shall remain under the jurisdiction and control of the police commissioner, police department or analogous officer or department of such city.

b. Any such board, commission or department so created shall have power to continue any business, proceeding or other matter commenced by any such police commissioner, department or other officer or agency by whom or by which heretofore commenced.

c. Any provision of law, rule, regulation, contract, grant or other document relating to the subject-matter of the functions, powers or duties and applicable to the police commissioner or police department or any other officer or agency of a city in relation to the regulation, direction, control and restriction of the movement of vehicular and pedestrian traffic in such city, (except as hereinbefore provided) shall apply to such board, commission or department of traffic control.

d. All rules and regulations made by the police commissioner, police department or other officer or agency of a city, pursuant to the city charter of any such city, local law or ordinance, in force when any such board, commission or department is created pursuant to this act, shall continue in full force and effect as the rules and regulations of such board, commission or department of traffic control, until amended, superseded or repealed by such board, commission or department.

e. Every right or remedy of whatsoever

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nature which existed prior to the enactment of the provisions of this act shall be available and shall survive unaffected and unimpaired by reason of the enactment of this act.

f. No action or proceeding, civil or criminal, pending at the time when this act shall take effect, by whomsoever brought, shall be affected or abated by the enactment of this act or by anything herein contained; but all such actions or proceedings may be continued notwithstanding that functions or powers of duties of any agency of the government of any city or of any other agency of government or public authority or officer party thereto may by this act be assigned or transferred to another such agency or officer, but in that event the same may be prosecuted or defended by the head of such assignee or transferee agency or officer.

3. This act shall take effect immediately.

MICHIGAN ROAD PLAN

Michigan's entire economy is geared to highway transportation, and dependence on motor vehicles is increasing.

Nearly $2.5 billion has been spent on highways and streets since 1910. Current expenditures are 20 per cent less than 20 years ago.

Motor vehicle registration is more than four times greater now than in 1920; total travel is over nine times greater. Both are still rising.

Accidents on the highways likewise are increasing. In 1947 the total of reported traffic acidents reached an all-time peak.

A summary of conclusions of a recent report of the Highway Study Committee of the Michigan Good Roads Federation follows:

Classification

To provide a basis for efficient management and sound financing, Michigan's highways, roads, and streets should be legally reclassified. Some additions and deletions are required on the state trunkline system. The major need, however, is for grouping of county roads into primary and local systems and of city streets into major and local street systems.

Operation and Maintenance

Wider application of traffic-control measures, effective action to provide off-stret parking facilities, and improvement of maintenance practices are required to obtain maximum service from existing roads and streets and thus hold construction needs to a minimum.

Physical Standards

Economy of road operation and maintenance as well as safety and convenience for the motorist require that roads and streets be improved to the highest physical standards consistent with the amount and character of the traffic they serve.

When traffic loads exceed the capacity of a two-lane highway, the road should be replaced by a four-lane divided highway. Average daily traffic above 12,000 vehicles a day on rural roads requires expressway design.

Over-All Needs

Forty-six per cent of the road and street mileage within the state is now deficient and requires improvement to meet the demands of today's traffic.

Five-sixths of aggregate expenditures required to overcome present deficiencies are needed on general-service roadways—rural and urban state trucklines, primary county roads, and major city streets—which comprise less than one-third of the state's total road and street mileage.

Expenditures required to remedy deficiencies are divided in almost the same proportion as total traffic—a little more than one-half on rural roads and the remainder on city streets.

Costs of meeting present deficiencies are so great that they can only be met through a long-range program. During the period while deficiencies are being overcome, roads and streets not now deficient will continually wear out and will require replacement. Additional expenditures will be required to maintain the road plant.

The cost of correcting present deficiencies in 12 years, together with annual replacement and maintenance costs, would amount to $179,141,000 a year. The cost of meeting these over-all needs in 15 years would amount to $158,444,000.

Financing the Program

A long-range program to meet present deficiencies should be carried out within 12 to 15 years.

A total of $73 million in additional funds would be required annually to finance a 12-year program and $51 million additional annually for a 15-year program.

All additional funds cannot be raised through motor vehicle taxation. State collected motor vehicle revenues should be spent mainly on general-service roadways—state trunklines, primary county roads ,and major city streets.

Substantial responsibility for financing local county roads and local city streets should rest on the local tax structure.

Present statutes governing distribution of state collected motor vehicle revenues to the State Highway Department, counties, and cities, should be repealed and a new formula based on needs, as set forth in this report, should be enacted.

Administration

To enable highway agencies to take on the heavy additional responsibilities of an expanded highway program requires state-wide coordination of highway administration, strengthening of administrative responsibility over highway matters, and continued improvement in administrative practices.

In all cases where state collected road funds are expanded, counties and municipalities should submit for approval by the State Highway Commissioner annual improvement programs based on long-range plans and make yearly reports to him on financial transactions and the condition of road systems.

The State Highway Commissioner should include in his biennial report to the legislature a section describing progress made by all highway agencies in carrying out the over-all program, including an accounting of all expenditures and a summary of the program scheduled for the next biennium.

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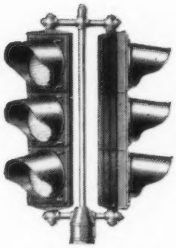
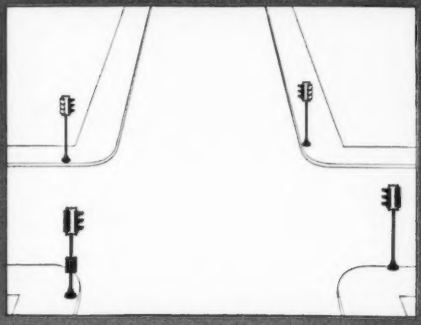
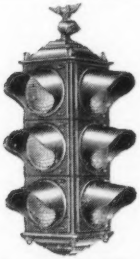


Type TRP-223D

Two-way, Three-section Adjustable Signal For Post Top Mounting

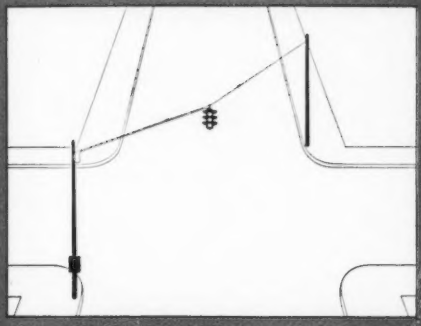


Typical Installation of TRP-223D Two-Way Post Mounted Signal



Type TSW-443D

Four-way, Three-section Non-Adjustable Signal For Mounting on a Span Wire



Typical Installation of TSW-443D Span-Wire Signal

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OPEN DISCUSSION

What is a "Traffic Engineer"?

Back in 1924, a more or less obscure Secretary in the Federal Cabinet (an engineer by profession) realized that the motor vehicle already occupied and would continue to utilize the public highway to an ever-increasing major degree; that it was to assume a key position in our domestic economy; that speed, individual control and other factors pertinent to a mechanical device contacting intimately the man; in the street would develop sundry problems, and that unless these problems were solved, hazard and congestion must ensue upon the public road.

With the sanction of the Chief Executive, and with the cooperation of the U. S. Chamber of Commerce, the first session of the National Conference on Street and Highway Safety was convened in that year. The session was open to all interested in "highway safety", and it was well attended by representatives from all over the country; government officers, engineers and laymen.

The keynote of the first session was the determination to curb the menace of the operator who was rapidly developing the automobile into a juggernaut which threatened the depletion of the population and the maiming of survivors in a deplorable degree.

The result of that session was to provide script writers with a text for a "horror campaign" which swept the country, and a request to delegates to return to their respective locales and collect information which might serve as a basis for discussion at a subsequent date.

The decade which followed may well be dismissed with the general comment that by 1930 the "spot map", the "Manual on Uniform Traffic Control Devices", the Uniform Vehicle Code andModel Municipal Ordinance had been born.

It may also be stated that by the time the 1930 session had adjourned, a slogan—"EDUCATION, ENGINEERING AND ENFORCEMENT"—had been adopted as the essential component to "Safety on the Highway", and with its adoption, the public was surfeited with an advertising campaign which coordinated the campaign against highway accidents and the products of the butcher, baker, and builder, not to mention the purveyors of finance and insurance.

Coincident with the birthdays above noted, the Institute of Traffic Engineers came into being and a profession was conceived which at its conception, and for many years thereafter, was devoid of any accepted basic formulae to the application of which it was committed.

The 1934 session, the last of the National Conference meetings, was characterized by a lack of recognition of technical personnel, and controversial debate between representatives of minority groups determined to subordinate other interests to their own. In consequence, safety propagandists sponsored, and in a major degree supported, by these groups, have taken over the promotion of highway safety, and have not hesitated to use the engineering profession as a stepping-stone to establish a dominating position on a national as well as a local basis.

Simply defined, Traffic Engineering is the technical application of recognized scientific physical principles to the coordination, regulation and control of all mobile units using the travel facilities in a given area.

In reality, it is not a new profession, but is more of an amplification of transportation technique.

In its broader sense, traffic engineering is the technical medium which affords safe and expeditious transportation and movement to users of the public road under regulation and control predicated upon volume, facilities and other factors.

The Traffic Engineer, in the pursuit of his profession, whether serving the public or a private interest, cannot evade the responsibility and obligation to recognize the right of the individual to use the highway, as a pedestrian or in a vehicle, with assurance of safety and convenience so long as the individual conforms with the requirements and restrictions which, from factual study, are indicated as essential to such assurance.

Intimate contact with highway transportation for nearly a lifetime, and close affiliation with the Safety and Regulatory programs since their inception, together with personal knowledge of conditions which prevail generally in most sections of the nation, justifies the assertion that it is time for the Traffic Engineer to resent their subordination to the mandate of minority interests, and to "sell" the public on the fact that neither intelligent Education or fruitful legitimate enforcement can be achieved until both are made to conform with the tenets of the Engineering profession.

It might be expedient to comment here that the long established canard as to the "moron" operator and pedestrian is without factual basis; that the general public are well aware of the travesties which characterize alleged technical regulation; and that the bombastic propaganda of the "safety" promoter rarely evokes other than adverse comment from the rank and file whose daily experience emphasize the deficiencies of existing control and regulation.

"What is a Traffic Engineer?"

To the more interested adult who knows his government he is a wasteful luxury whether he is an individual or a departmental division, devoting his time at the taxpayers' expense to surveys, analysis and the preparation of recommendations, all of which are obsoleted by the lapse of time before they are actuated, or, as is more often true, because of the resistance of minority influences which dominate the governmental picture.

To the less studious and more practical average citizen, he is the instigator of traffic control by signals and signs which lack the fundamental essentials of visibility, the parking restrictions, speed limitations, turning regulations, stop and one-way streets, and other pronouncements and devices, which constitute the basis for enforcement by a police department, supplemented by traffic courts from which revenue is derived by the imposition of fines generally so negligible in amount as to make a successful defense a wanton extravagance.

In the educational field the material propounded for use in the school is so inconsistent with the factual conditions attending traffic regulation that teachers, parents and even pupils who have not reached their teens are alert to ignore its application and conformance therewith, with even the youngsters defending their violations of regulations by pointing out specifically the fallacies therein.

All of the foregoing must not be construed as an attempt to disparage the "profession". On the contrary, it is hoped that a consideration of the facts cited will inspire an aggressive policy which will demand recognition of the need for technical supervision of movement by the government, and command the support of the public for that demand.

In spite of the numerical growth of the profession, there is no recognized effort to secure for it the precedence to which it is entitled in either present pronouncement or projected planning, nor is there any evidence

of legislation essential to effectuate adopted recommendations.

For example, accident cause summaries, published with a view to arousing the emotional interest of the public, rarely if ever indicate the contribution, in any degree, of the lack of technical treatment of the existing circumstances, or, where some treatment has been attempted, the inadequacy or deficiency thereof.

Theoretically perfect progressive control systems are saturated with congestion and potential hazard through failure to establish and enforce regulations requisite to insure their operation; the "Manual on Uniform Traffic Control Design" is replete with suggestions of ineffective and inadequate alternatives, the enforcement of which cannot be legally sustained, yet this Manual is at least tacitly if not positively approved by the brotherhood; the hazard and/or congestion potential attending parking is apparently dissipated when the parking meter produces revenue; unrestricted vertical expansion bringing additional movement into already saturated areas continues without protest; and the proponents of uniform standards continue to advocate the subordination of the Traffic Engineer and his profession to the dictates of Traffic Commissions dominated by unqualified political satellites and representatives of minorities whose interests may be and usually are adverse to those of the general public.

Since the profession is restricted to the public highway as its field of endeavor, is it not manifestly imperative that the public be sold on the need for its recognition as a fundamental prerequisite to the efficient operation of this facility?

There is no question of the progress which has been made by the profession since 1930, nor can it be denied that it has been accorded recognition to a restricted degree by Safety propagandists who do not hesitate to dignify their programs by the inclusion of Traffic Engineers as participants in discussions on "Traffic Technique" whereat the topic is hand-picked and all utterances well censored.

As, if and when the opportunity is afforded, no one is better qualified to identify himself than the "Traffic Engineer."

Unfortunately, in the past and for the present, the conditions predominating in our governmental system preclude any forthright statement by the individual engineer.

It is apparent that the Institute, devoid of the limitations and restrictions imposed upon the individual, is not only competent but ethically obligated to provide the opportunity, and having made such provision, to make such identification in its fullest import.

Then and only then will be satisfactorily answered the public's query:

"WHAT IS A TRAFFIC ENGINEER?

WALTER A. SPRATT, Assoc. ITE
Traffic Consultant
Long Beach, N. Y.

ON THE SHELF

"Curb parking is expensive beyond computation and contributed more than any other one factor to traffic congestion," according to Wilbur Smith, writing in FBI Law Enforcement Bulletin.

"It is a traffic maxim that any obstacle to traffic movement creates congestion, and it is equally true that congestion causes accidents."

Surveys indicate that approximately 17 per cent of city accidents and 10 per cent of rural accidents involve vehicles which are parked, are maneuvering into or from a parked position or are stopped in traffic. Five per cent of pedestrians killed in cities and 6 per cent of those killed in rural areas enter the roadway from behind parked cars.

Smith says the indirect influence of angle parking on accidents is greater than that of parallel parking. He says drivers leaving angle parking places are inclined to move their cars blindly into the traffic stream, forcing moving cars to swerve.

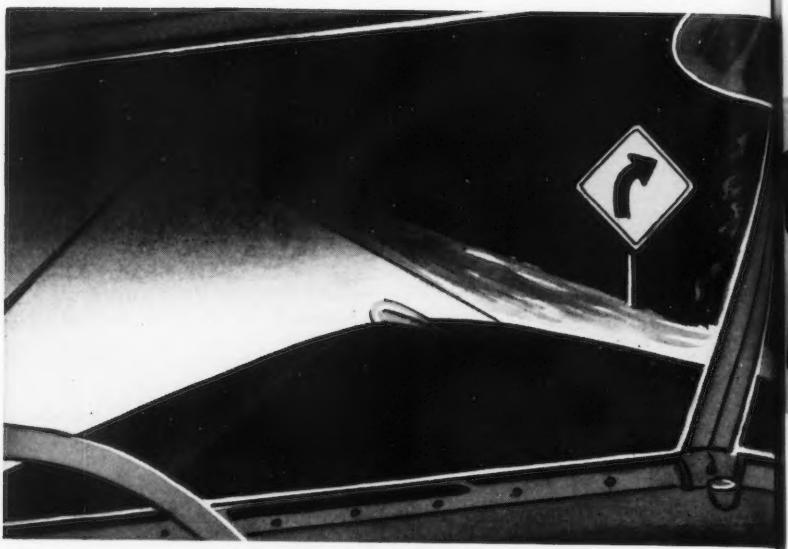
Also to avoid collision with cars parked at an angle, drivers tend to "steer clear" of them as much as 5 or 6 feet. Some drive with their left wheels over the centerline.

"Another hazard created by angle parking," says Smith, "is drivers making U-turns across oncoming traffic to enter curb spaces on the opposite side of the roadway."

A survey on a Chicago business street showed a 63 per cent reduction in accidents when angle parking was changed to parallel. In Kansas City, angle parking was changed to parallel and then changed back to angle. With angle parking there was an average of five accidents per block per year involving parking. With parallel parking, the accident rate was one per block per year.

A main street in a Minnesota town of 10,000 population had a bad traffic condition. Signals were requested. Parking was changed from angle to parallel, and traffic flow became so orderly that the request for signals was withdrawn.

Running times of buses and street-



Wide Angle Traffic Yellow "Scotchlite" for warning signs.

Wide Angle Traffic White "Scotchlite" for regulatory signs.

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REFLECTIVE SHEETING

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cars have been greatly reduced, Smith reports, by changing from angle to parallel parking, by prohibiting parking during rush hours and by other parking measures. He adds that when parking is prohibited, care is necessary to see that stopping and standing are also prohibited.

Traffic capacity of streets on which parking is not allowed in Washington, D. C., has been increased 15 per cent by adding "no stopping" regulations during rush hours. Accidents were practically eliminated over a four-block area of New Haven, Conn., by prohibiting parking during peak hours of the afternoon.

Smith cites some cases of double parking at its worst. In one case, double parking was tolerated to such an extent that few drivers pulled to the curb, fearing entrapment by double parkers. In a small town, conditions got so far out of hand that officials were requested to erect "No triple parking" signs.

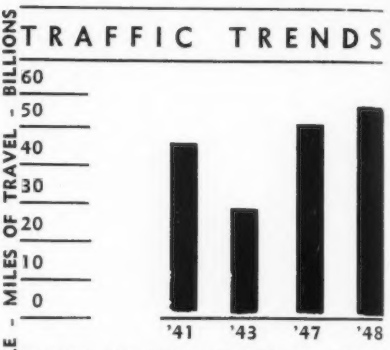
"Many parking accidents occur on some of the best highways," Smith reports. "One of the Nation's finest highways, New York's Meritt Parkway, has many accidents involving parked vehicles. During some of the war period, one-fifth of all accidents on this road involved parked vehicles."

Stalled and stopped vehicles cause many collisions and fatalities on rural roadways. In 1945 about two thirds of the deaths in interstate motor vehicle accidents resulted from such vehicles being stopped in or along the roadway because of mechanical defects.

—o—

Utah. University of Utah. Department of Civil Engineering.

Proceedings of the eighth annual highway engineering conference, compiled and edited by A. Diefendorf. The University, 1947. 141p. (Bull. no. 33 of the Utah Engineering Experiment Station.)



TRAVEL ON RURAL ROADS FOR FIRST FOUR MONTHS OF 1941, 1943, 1947 AND 1948.

IMSA DELEGATES VIEW EAGLE'S NEW QUARTERS

Adin Chase, president of the International Municipal Signal Engineers Association; G. O. Wilson, chairman of the Midwestern Section I.M.S.A., and Matthew Porosky, president and general manager of Eagle Signal Corporation, were among those instrumental in making the annual I.M.S.A. spring educational program a success.

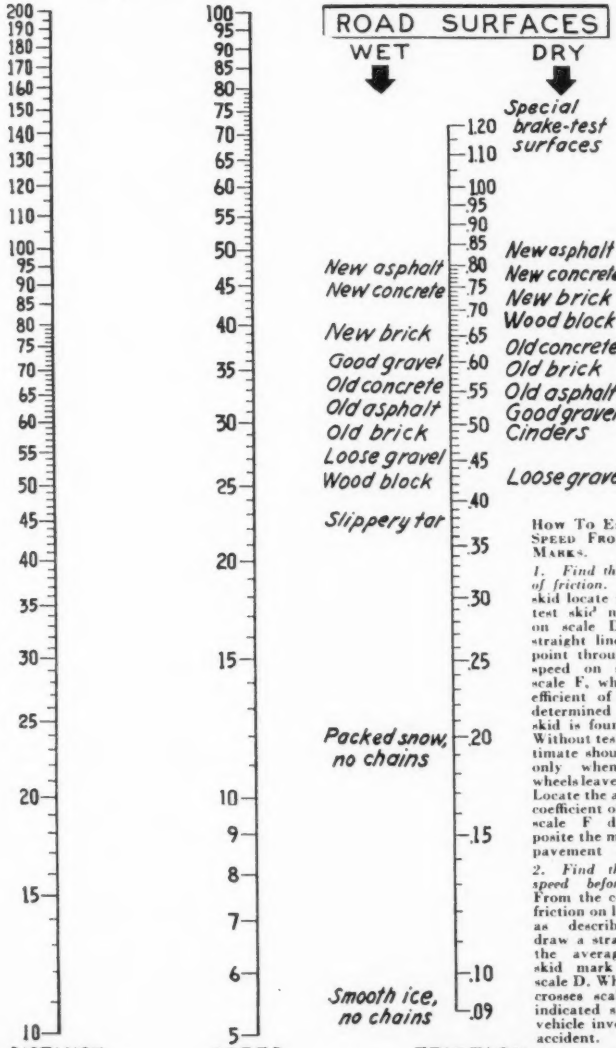
Convention delegates were the first to see Eagle Signal's new spacious quarters in Davenport, Iowa. New equipment has been purchased and modern methods employed in this new division to insure increasing high quality and maximum efficiency of products.

Oregon. University of Oregon. Bureau of Municipal Research and Service.

Street trees for cities. Planning bulletin no. 1. The Bureau, 1947. 16p.

REFERENCE NOTES

SPEED-BRAKING DISTANCE CALCULATOR



NORTHWESTERN UNIVERSITY
TRAFFIC INSTITUTE

How To Estimate Speed From Skid Marks.

1. Find the coefficient of friction. With test skid locate the average test skid mark length on scale D. Draw a straight line from this point through the test speed on scale S to scale F, where the coefficient of friction as determined by the test skid is found. Without test skid an estimate should be made only when all four wheels leave skid marks. Locate the approximate coefficient of friction on scale F directly opposite the most suitable pavement description.

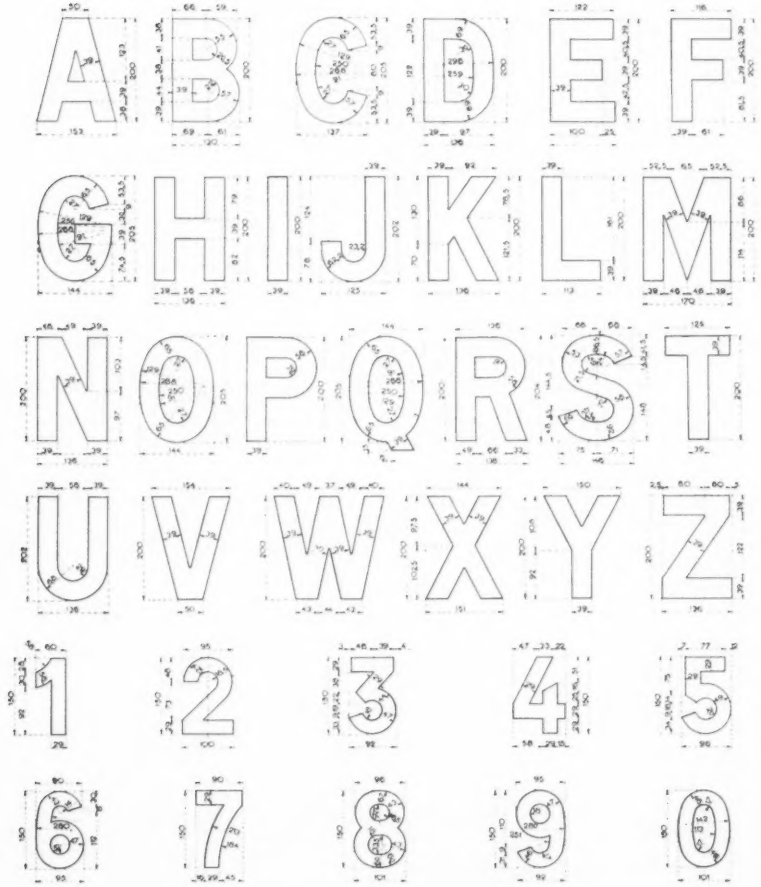
2. Find the estimated speed before accident. From the coefficient of friction on line S, found as described above, draw a straight line to the average accident skid mark length on scale D. Where this line crosses scale S is the indicated speed of the vehicle involved in the accident.

3. Remember that special calculations are required when part of the skidding is on one kind of pavement and part on another, when the skid was uphill or downhill.

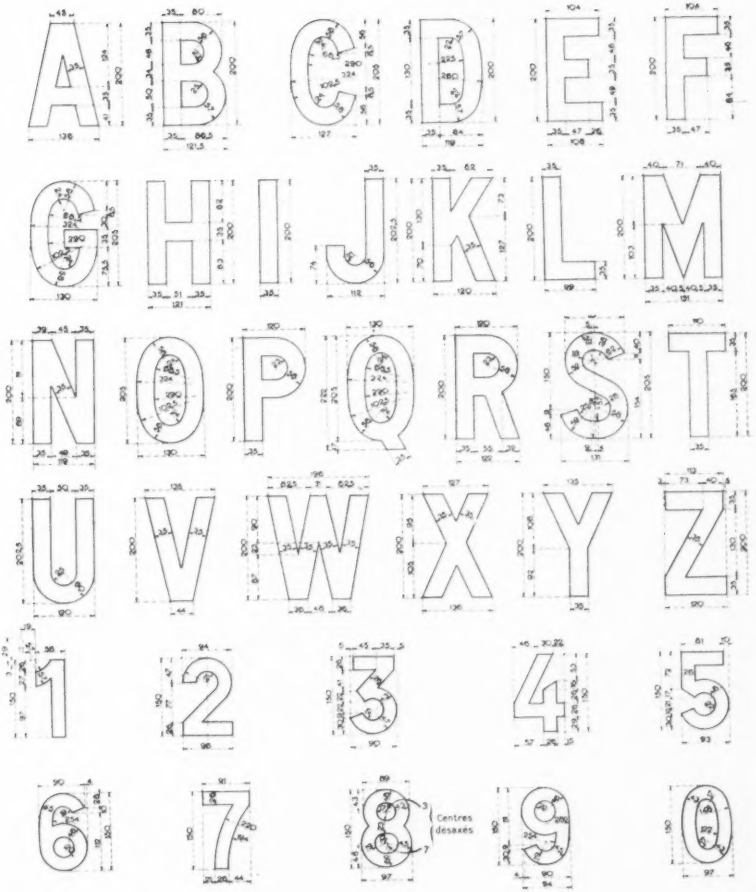
FRENCH SIGN STANDARDS ILLUSTRATED

Illustrated below and on pages 429 and 430 are design standards for French sign letters. Measurements are in the metric system, one centimeter equals 0.3937 inches. These drawings are reproduced from "Instruction Generale sur la Signalisation Routiere" and were furnished TRAFFIC ENGINEERING by the U. S. Associates of the International Chamber of Commerce.

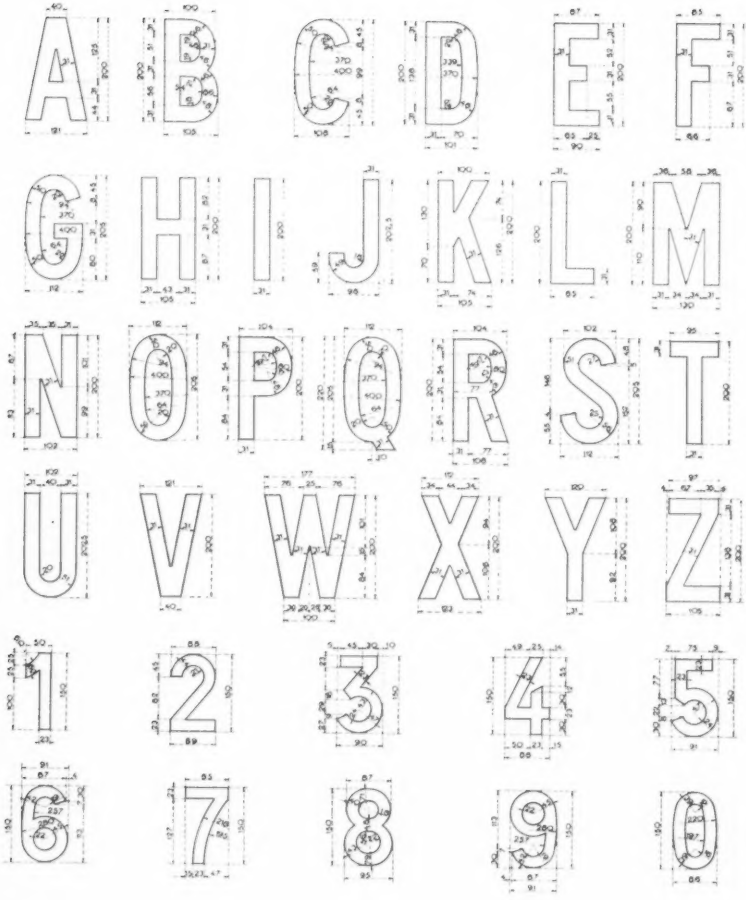
K1 - CARACTÈRES LARGES



K2_CARACTÈRES NORMAUX



K3-CARACTÈRES RÉDUITS



The Traffic Jam

by LESLIE WILLIAMS, *Member, ITE*

You have all seen traffic congestion—at least pictures of traffic jams and blockades—with motor vehicles backed up in long lines.

What caused this congestion? Was everyone leaving work at the same time? Was a street car stuck in an intersection? Was it an automobile improperly parked? Was it too many cars and too little street space? Or is traffic congestion caused by forces deeper and more fundamental than these?

How do you go about measuring congestion? What yardstick will you use? These and similar questions must be answered before we can begin advocating or applying pet remedies with any assurance of real relief.

Everybody apparently, is experiencing congestion nowadays. Reports coming into my office from all over the country bear out what one civic leader wrote,—"The nation is experiencing its greatest traffic jam in history."

Morning Rush

Every day from 8 in the morning to 6 at night, our business centers and the thoroughfares serving them are subject to severe attacks of traffic congestion.

Every morning motor vehicles carrying people and goods pour into urban centers and keep pouring in until about 2 o'clock when the thoroughfares become filled to overflowing, and then the traffic stream begins to pour out again reaching flash flood proportions around 5 o'clock.

Traffic delays and conflicts are spreading out from the congested centers along our main routes like a conflagration searing properties and businesses and destroying the already damaged and declining values in our business centers. The annual economic loss from traffic congestion has now mounted into the billion dollar bracket.

"Now is the time to act" say our public officials and business leaders; but that's as far as it goes. Why? They immediately run into a babel of conflicting and contradictory conclusions. So the meeting breaks up and someone calls another "Now is the time to act" work conference probably under new auspices and sponsorship.

Congestion Defined

What is this thing called "congestion" which creates such an impasse and dilemma and brings forth from normally logical persons such "sure fire cures" that other highway users feel could spring only from confused and disorganized minds?

Traffic congestion is a paradox—a seeming contradiction, because traffic congestion increases as man's mobility increases. In essence, traffic congestion is man's mobility in reverse or in low gear.

Discouraging isn't it? But, if we will regard traffic congestion not as the basic cause of urban difficulties, but rather as simply the manifestation of underlying forces acting upon our civic organism; and if we will then take the trouble to ferret out, analyze and understand these forces, we will probably get a clearer concept of where to begin in attacking traffic congestion in terms of immediate palliatives and long-term plans for bringing permanent relief.

As long as there is a high level of business activity and employment, there will always be a high volume of daily travel and personal mobility. This, coupled with reasonable prices and rising standards,

encourages greater use of individual means of travel—the private automobile.

Decentralization

Urban population, as defined by the U. S. Census Bureau as places with 2500 population and over, is increasing; but the central areas of our cities are experiencing a decline in population, while the outlying fringes and the small towns are experiencing a building boom greater than at any previous period. In other words, the centripetal forces working for urbanism have been overcome by the centrifugal forces for decentralization.

Highway improvements, advances in single-family homebuilding and advantages of living in outlying areas have also accelerated the outflow of population from our cities and in turn encouraged further use of individual means of travel, particularly if there are little or no express mass transportation services from the outlying districts to city centers.

There are more private cars, trucks and transit vehicles on the road today than ever before. Motor vehicle mileage is way ahead of expectations. It topped 350-billion miles in 1947 and is estimated to reach 500-billion miles by 1967. There is also a potential market for 60-million motor cars in the United States, and the new markets do not lie in the rural areas or the small towns, but in the medium and large sized congested cities.

Furthermore, public transit riding—the competitor of the automobile—is falling off. Riding fell off 3% in 1947 and a moderate decline is expected in 1948. Bus manufacture is being reduced this year.

The present outlook is not bright. We have little or no control over

(See WILLIAMS, *page 438)*

IN THE SPOTLIGHT!
TUTHILL GUARD RAILS
for safe, sure service
UPTODATE highways need modern guard rail protection. Here's why it will pay you to install the TUTHILL Guard Rail:
SAVES LIVES. The springy, convex rail keeps cars from going off the road. At night, too, it shows up clearly under headlights, plainly marking the course of the road.
SAVES DOLLARS. The one-piece, weatherproof Tuthill Guard Rail is simplicity itself. Easy and quick to erect. Never can sag. Requires little or no maintenance.
Be wise. Select the Tuthill Guard Rail for your highway installations.
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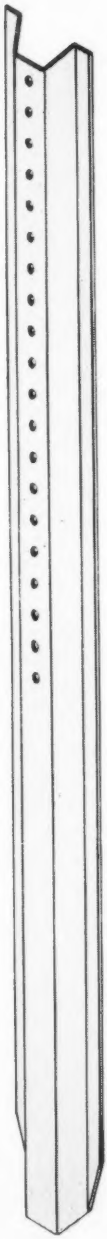
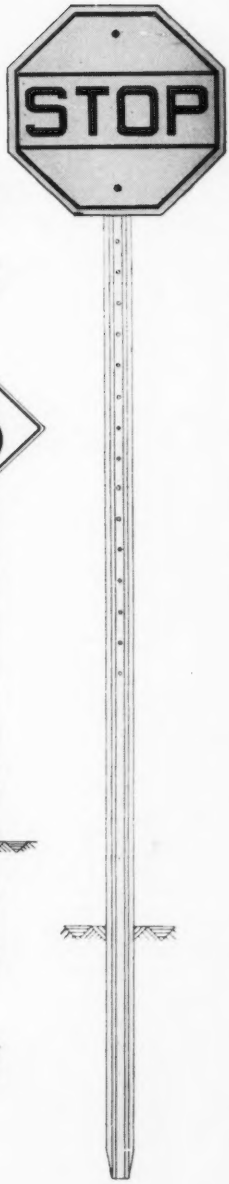


available

Almost Everything You Need



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Activities . . . .

SECRETARY'S COLUMN

By the time this column goes to press, the wheels of progress that have been grinding steadily in our two Annual Meeting Committees for the past few months will have accelerated to a fever pitch of activity, centered around national headquarters. The major activity of the Technical Sessions sub-committee under the chairmanship of Phil Mancini was completed when a tentative outline of subjects and speakers for the technical program was turned over to your Executive Secretary recently. Official letters of invitation to selected speakers are in the mail, a few checkbacks with Chairman Mancini will iron out minor details and the job of this sub-committee will be complete except for work of selected session arrangers at the time of the Annual Meeting. Meanwhile, the Local Arrangements sub-committee, under the direction of Walter Matthews has begun to accelerate its activity in preparation for showing registrants a good time and handling the many intricate details of program printing, publicity, registration, entertainment, field trip and special entertainment for the ladies. The work of this committee will reach its peak at the time of the Annual Meeting. National headquarters must maintain close liaison with the two committees, correspond with speakers, presiding chairmen and session arrangers, issue special invitations to other national organizations, and prepare special announcements and invitations to State Highway Officials, Mayors and City Managers urging them to send members of their traffic engineering staffs to the meeting. All the loose ends must be tied together into a smooth-working machine so that the entire annual meeting program will be a credit to the traffic engineering profession and a focal point for the renewal of old acquaintances and the exchange of professional knowledge for members and guests. The above should give you a brief glimpse of the "behind the scenes" activity necessary to produce the master product. We can assure you it is no picnic, but with the continued support and cooperation of all concerned we anticipate the most successful meeting in Institute history. Watch other columns in this and subsequent issues for more details of our 1948 Annual Meeting.

ROBERT S. HOLMES

SCHEDULE SAFETY COURSE

The American University of Washington, D. C., is to hold an *Institute for Instructors in Highway Safety and Driving*, June 29 to July 9, 1948. The objectives of the course are to prepare present and prospective high school and college teachers for giving instruction in highway safety in the classroom and behind the wheel; and to give educational administrators and others who are interested a knowledge of the problems involved in inaugurating and administering safety and driving instruction.

ITE members who will participate include Norman Damon, Burton Marsh, and Earl Allgaier.

I T E PERSONALS

ROSS SHOAF and **L. A. WEYMOUTH** were among the ITE members attending the University of California Traffic Planning Seminar at Berkeley Campus March 29th.

FRANK MEYERS, now with the City of Oakland City Engineering Department, still talks traffic with **JAY CZIZEK** at every opportunity.

HAROLD HAMMOND has been appointed manager of the Transportation and Circulation Dept., U. S. Chamber of Commerce. **FRANK TWISS** has been selected assistant in the same department.

BOB FORSTER has accepted a position with **BUD YOST** at General Motors, Detroit.

To guide CSEA (California State Employees' Association) for 1948, the delegates to the general council elected unanimously **F. M. CARTER**, elevated to the top job from the vice-presidency. Since entering state service in 1934 Carter has been extremely active in CSEA work and in recognition of his outstanding efforts he has been selected in the past to serve as president of Sacramento Chapter No. 2; state membership chairman in 1943; regional director, District III in 1944; director of law and legislation in 1944 and 1945; member of the Civil Service Committee in 1947, and vice-president. At the present time he is serving with the Division of Highways Headquarters Staff as an Assistant Traffic Engineer, consulting on traffic control devices and highway lighting.

The following observations were made by **Bob Swain** when he visited Yale's Bureau of Highway Traffic and the ITE headquarters in New Haven last month. **TED MATSON** is planning to complete his traffic engineering textbook this summer. The outline of Ted's book shows considerable promise and should result in the most complete single volume coverage of T. E. profession. **FRED HURD**, ITE's secretary-treasurer and a member of the Yale Bureau staff, has developed a series of traffic engineering problems to be solved by Bureau students. Many of the problems are taken from actual projects. The amazing result of this work, according to Ted Matson, is that frequently the students arrive at the same solution adapted by professional engineers in which case, it must be assumed low grades are awarded. **WILBUR SMITH** is still active in numerous fields and has recently added part of the administration study for which Alfred P. Sloan gave $15,000. The smallness of **BOB HOLMES'** office does not reflect the large volume of work he and the other two members of the ITE staff produce. Bob's enthusiasm for ITE work has made him reject a number of more attractive positions. One thing ITE directors should insist upon is that Bob take a vacation this summer. **ED RICKER** was at the Bureau picking up advice in connection with his work as traffic engineer of New Haven. The course at Yale still includes visiting firemen to lecture on police and politics. These two subjects, when thoroughly understood, make a traffic engineer.

HENRY OSBORNE has suggested that we use jokes in the magazine and submitted one which couldn't be used.

JOHNNY JOHNSON, managing editor, recently acquired an addition to his family in the form of a third boy.

Glen Smoot of Arizona has obtained official recognition for ITE. The Arizona legislature passed H. B. 100 from which the following is quoted:

"EXECUTIVE OFFICER. The Arizona state highway commission shall appoint a traffic engineer who shall be the executive officer of the safety division. The traffic engineer shall be qualified as a member of the Institute of Traffic Engineers to perform the recognized functions of a professional traffic control engineer. The traffic engineer shall be competent to deal with the planning and geometric design of streets, highways, and abutting lands and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods. The traffic engineer shall be experienced in traffic safety administration."

SECTION NEWS

NEW ENGLAND SECTION

The New England Section held its annual meeting on May 12, 1948 in New Haven. Election of officers for the year of 1948-1949 was held and the following are the officers selected: Earle W. Osterhoudt, president; Edmund R. Ricker, vice-president; Charles S. LeCraw, Jr., secretary-treasurer.

Mr. Osterhoudt and Mr. LeCraw were re-elected to the same offices held during the past year. Other business included a report by Senior Delegate Matson on a recent meeting of the Connecticut Technical Council. The New England Section was elected to membership of this engineering council of professional societies on February 23, 1948. Mr. Matson indicated that the Council was asking for a vote from each of its members relative to the exclusion of engineers-in-training from Universal Military Training or Selective Service. The New England Section unanimously agreed that those engineers who have already begun technical training should be allowed to continue such training without interruption, in order to avoid a serious shortage of qualified traffic engineers. The report from the secretary-treasurer showed a sound financial condition. The President appointed Mr. Matson as Chairman of the Program Committee for the coming year, and Mr. Ricker as Chairman of the Entertainment Committee. Plans were discussed for a summer outing in August. The Section has been invited by the Eno Foundation to hold this outing on their extensive property in Saugatuck, Connecticut.

Following the business meeting, President Osterhoudt turned over the Chairmanship of the meeting to Mr. Cysewski, President of the Yale Student Chapter, to conduct the technical phase of the program. Mr. Cysewski first called on Mr. John T. Hanna who gave an interesting presentation summarizing the development of his thesis relating to the users preference for parking garage vs. parking lot. Following Mr. Hanna's presentation, Mr. William T. Taylor, Jr. summarized his thesis work relating to a study to determine minimum time periods required to obtain stable results when conducting rural O & D studies. After a brief discussion of these papers and a few closing remarks by Mr. Cysewski, the meeting was again turned over to President Osterhoudt.

FLORIDA SECTION

The April meeting was called to order by President Reeder and the minutes of the last meeting were read and approved. The secretary-treasurer filed his annual report. Mr. Grunow made a verbal report and described plans for activating the Tallahassee Section. It was anticipated that this Section would get underway very soon. Mr. Grunow's report was approved. Mr. Vanderstempel reported on the Miami local activities and stated that it was proposed to hold joint meetings with other organized groups in addition to the usual meetings. His report was adopted.

Mr. Reeder then gave the general report of the activities of the Miami Section of the ITE and plans for the future. Mr. Reeder stated that at forenoon on the second day of the Second Annual Highway Conference, at the University of Florida, at Gainesville, time was to be devoted to the discussion of general traffic problems. Vanderstempel would read a paper on the engineering side of transportation; there would be a discussion on Aerial Photography by Walter Parker; and the question of parking would be handled by panel discussion. It was suggested that interest in this meeting on May 31st and June 1st be stimulated.

Mr. Reeder appointed Mr. Grunow as official delegate to the Annual Meeting of ITE, with Parker as alternate.

There was some discussion of asking the ITE to hold its Annual Convention in 1949 in Miami, however, it was decided that the Florida Section was not yet in a position to issue such an invitation.

Mr. Reeder then called for the election of officers for 1948-49. Mr. Howard nominated Mr. Grunow for President. There was no second. Mr. Vanderstempel nominated the same officers. Friedman stated that he was not in position to serve as secretary-treasurer any longer and would appreciate being relieved of the responsibility. Mr. Reeder then called for nominations for the individual offices. The following were elected: Earl J. Reeder, president; Robert W. Grunow, vice-president; T. M. Vanderstempel, secretary-treasurer.

MICHIGAN SECTION

Al Hanson, our chief caterer and the guy you can thank for this steak dinner, broke open the door to the PLC Clubhouse and tapped a keg of beer at 5:00 P.M. last February. At 6:30 P.M., some 52 engineers and guests who ordinarily can't afford a steak dinner sat down at the table with that half-starved gleam in their eyes, snatching steaks as the waiters attempted to serve. Prexy Harger formerly called the group to order at 7:15 P.M., stating, "Quiet! Yuh Bums." The minutes of the previous meeting were read. Your secretary was highly complimented for comprehensive and exact recording of events. I won't say who got that cigar I handed out. Oh! Yes, a treasurer's report was presented. Mr. Gunderson expressed amazement that the balance was in black figures. Some sort of tie-up with Ohio traffic engineers was discussed. Your secretary was instructed to contact the Ohio group. This was done and a number of responses received.

Gordon Graham of the Detroit Board of Education did a splendid job of describing the local program of school-child crossing protection. Sgt. Staats of the Detroit Police Department illustrated the practicability of the program with some interesting comments drawn from experience. Not to be outdone by an educator and police officer, our own Teke Wiley, finished off the panel discussion—and I do mean finished—by giving us the inevitable formula for getting kids across the street.

Russ Harrison

WESTERN SECTION

The Western Section continues to roll and as the rolling stone we gather no moss—but plenty momentum. Now is the time to think in terms of an annual meeting and officers for the coming year. Area meetings are scheduled now for Los Angeles July 14, and for Corvallis July 28. The first item of agenda for those meetings will be the when and where of the annual meeting. Your officers are thinking in terms of San Francisco in August but your reactions are wanted for guidance.

The nominating committee appointments are as follows: Arch Bollong, chairman; Fred Fowler, Al Head, W. E. DeYoung, and Glen Smoot.

Engineering Conferences in Los Angeles July 14, 15, and 16, and in Corvallis July 28, 29, and 30, which will be directed by Wilbur Smith and Bob Holmes, the Tenth Annual Western Safety Conference holds forth in Hollywood, Roosevelt Hotel, June 16, 17, and 18. An interesting traffic section is promised.

Three members of the ITE have a whale of a job on their hands in L. A. Under the direction of D. Grant Mickle, a survey committee has been appointed by the L. A. City Council to study the administrative functions of the city government related to traffic toward the ends of recommending improved organization and administrative procedures. Stuart Bate and Joe Havenner are Mickle's right and left hand men.

WASHINGTON SECTION

Twenty members and guests met in the Club Studio of the Hotel Fairfax on the evening of May 5 for the regular meeting of the Washington Section.

Business included the appointment of a nominating committee, consisting of W. G. Eliot, 3d, Chairman, M. O. Eldridge and Earl Allgaier, who are to report in writing prior to the date set for the June meeting and election of officers for the 1948-1949 year.

Tentative dates for the first fall meetings were announced as follows: September 22, October 22 and December 8.

An interesting and unique device was exhibited by one of the members. It consisted of a three-dimensional representation of traffic volumes on a major highway by all hours of all days for an entire year. Daily variations could be observed in one plane, hourly variation in another and other details by different perspectives.

The speaker of the evening was John C. Bohorfoush, Chief of Transportation, U. S. Department of State, who presented one of the highlight lectures of the year on "The Transporting of V. I. P." (Very important persons). It was amazing to learn how much more complicated is the transportation of U. S. and foreign government high officials and diplomats than is the transportation of W. O. P. (We ordinary people).

BLUE PRINT FOR *Better Living*

PICTURED above is a night view of Mt. Morris, Illinois — a good place to live, a place where you can see where you're going after dark.

Mt. Morris can boast of such qualities because, like Park Ridge, Aurora, La Grange and other northern Illinois communities, it enjoys the benefits of a modern street lighting system, that was scientifically planned **before** it was installed.

This method of pre-planning good street lighting, though not unique, has been perfected in this area through the joint efforts of local officials and electric utility companies. Briefly, it consists of (1) a thorough survey of needs—present and contemplated; (2) a realistic recommendation for improvements based on those needs—establishing priority for locations where new lighting is most needed; and (3) the provision of the right **amount** of light, uniformly distributed and properly arranged, combined with adequate maintenance.

Typical of the public enthusiasm that results is the comment of M. F. Dorothy, Chairman, Retail Merchants' Div., Aurora Chamber of Commerce: "(Our) modern street lighting has reduced traffic hazards and encouraged night window shopping. I consider well-lighted streets a MUST in any city building program."

To Public Service Co. of Northern Illinois, Western United Gas & Electric, Illinois Northern Utilities Co., and Commonwealth Edison belongs the credit for an outstanding job of public education, sound engineering and **service** that anticipates the needs of the people.

The Street and Traffic Safety Lighting Bureau, 155 East 44th Street, New York 17, N. Y.

(WILLIAMS, *Con't from page 432*) these basic causes of traffic congestion, not to mention snowstorms.

Nothing short of a severe economic depression can sharply reduce street congestion in the next decade. Do we want that?

New in-town expressways, off-street parking and other terminals, while only a partial answer, are not keeping up with the increasing mobility of man, and to date are little more than pious pronouncements of politicians.

"Abandon the Place"

Long-range city planning improvements, necessary to reconvert our cities to meet the requirements of the automotive age, are still in the talking stage. The gap between plans and performance is apparently so great that one prominent architect is quoted as saying "Our cities are fit only for the burial plot" and another, when asked what he would suggest for one of our large cities said "Abandon the place."

The ultimate solution lies in the evolution of the "Fluid City of the Future." This will be when the urban area is made up of a series of cellular units, designed for and devoted to living, working, learning and playing, and arranged organically by neighborhoods and linked together by means of a balanced system of transportation. The congestion-free community of tomorrow—and that "Tomorrow" seems a long way off—is based on the thesis that if planners will concentrate on developing coordinated systems of communication and transportation to meet the *desire* trend; the fluidity or mobility of man,—then the land use interstices will adjust themselves into a functional arrangement suited to the automotive age and serving the public's best interests and expressed desires. This, however, is only a goal —a picture of future possibilities to keep in mind and plan for.

The alternative goal is the British Sarden factory, walk-to-work small town concept.

In the meantime, the best we can hope for is to alleviate the present situation the best we can with tried and proved traffic engineering, enforcement and educational measures, to get the maximum use out of what we have in the way of existing streets, transit facilities and available off-street space suitable for automobile parking, bus and truck loading and unloading terminals.

We shall have to start here in any case because our existing streets are relatively permanent and they will have to carry the bulk of future traffic, if and when expressways and parkways are built. And by *traffic*, I mean the movement of people and goods and not simply vehicles.

Travel Mode

Speaking of moving people and not vehicles brings up the point of the relative traffic importance of mass and individual passenger carriers.

In large cities with rapid transit systems, 4 out of 5 persons coming to the business center do so in transit vehicles. In the smaller cities, under 25,000 population, the mode of travel is generally the other way around. These are general figures, but during the A.M. and P.M. rush periods, public transit is by far the major carrier of the people.

There are times and places when the transit vehicle should be given preference over the automobile, particularly in business districts and during heavy travel periods. Over 22 *billion* persons took rides on public transportation in 1947 and a large percentage of these were carried during the rush hours.

(Cont'd on page 440)

Grote REFLECTOR SIGNALS FOR SAFETY AND ECONOMY

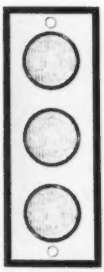
Don't be satisfied with material of low reflecting intensity that requires frequent replacement.

Safety demands reflectors of extremely high reflecting power.

Now you can standardize on Grote reflectors—for marking bridges, abutments, clearance limits, culverts, gateway entrances, road delineators or road ends.

These Grote units are equipped with Grotelite prismatic reflectors, precision molded from shatter-resisting Plexiglas. The total refraction optical principle insures brilliant reflecting efficiency at long or short instances. Grotelite reflectors do not black out in fog or rain. Housings for all units are fabricated from heavy gage rust resisting steel, finished in baked enamel.

Standardize on Grote for Safety and Economy.



STREET NAME UNITS • REFLECTOR BUTTONS

THE GROTE MANUFACTURING CO., INC., BELLEVUE, KY.

(Cont'd from page 438)

Public officials are greatly interested in expediting transit vehicles and holding up the level of transit riding. A survey conducted by the Mass Transportation Committee of the American Road Builders' Association last year among public officials in 315 cities of 25,000 population and over, showed that these officials are keenly aware of transit's place as a carrier of people in a community and are interested in getting transit improvements.

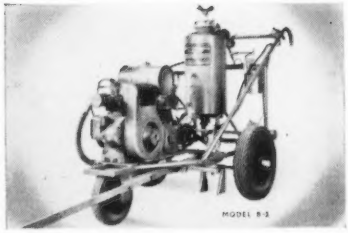
Asked what means they would suggest for expediting public carriers and maximizing the riding, they replied:

Substitution of buses and trolley coaches for street cars.
Changes in routings.
More express service.
Reduction in transit stops.
Improved transit loading practices.
More modern equipment.
Better schedules and schedule maintenance.
Off-street terminals and protected waiting stations at transfer points to get the people in out of the weather.
Reduction of turning movements.
Adequate length of bus stops.
Increased curb radii.
Elimination of street jogs and offsets.
Fringe parking and shuttle bus service.

These are improvements for transit suggested in addition to the elimination of curb parking and improved signal timing, on transit streets one-way movement, staggered hours and other traffic control measures.

Transit must heed such traffic control measures. What is in the best interests of the community is in transit's best interests even to promoting the provision of adequate "destination parking" in downtown districts, for a decongested and accessible downtown draws people and business and stabilizes the district to the benefit of transit.

This is the Kelly-Creswell Model that will SOLVE your Municipal Zone-Marking Problems.



Uniform Cross-Distribution
Clean-Cut, Attractive Lines
Pressure Cleaning Equipment
Air-Actuated Traction.

More Highway Zone-Marking Material is applied thru K-C Equipment than thru any other make. **There must be a reason.**

KELLY-CRESWELL CO., Xenia, Ohio

COUNTIES *Solve*
Traffic Problems With
Traficounter

The Traficounter is used by scores of county highway departments throughout the country. Here is a typical comment, from the office of a county highway engineer regarding the excellent use being made of these precision built instruments.

"We have four Traficounters and find that they are a great help in getting continuous traffic count of certain sections of road. Our County road system is surfaced largely with pit run gravel and we have now reached a stage where—in our Post-War construction—we will have to do considerable regrading and bituminous surfacing.

"Traffic counts taken before gasoline rationing are proving valuable in determining what roads should be included in this program from a traffic standpoint."

This "lightning fast" automatic counter of motor traffic consists essentially of an electric counter and recorder which registers the count of cars that pass the detector. **Streeter-Amet Company, 1726 Belle Plaine Avenue, Chicago 13, Illinois.**

STREETER-AMET

When writing to advertisers, please mention TRAFFIC ENGINEERING

Personalities . . . .

Alger F. Malo has been named city traffic engineer of Detroit by Mayor Eugene L. Van Antwerp. He succeeds Lloyd B. Reid who has resigned from the city post in order to devote full-time to consulting engineering practice.

Mr. Malo, or "Al" as he is widely known among fellow ITE members, assumes his new duties with a background of 15 years experience in highway and traffic engineering. A graduate of the University of Detroit with a B.S.A.E. degree, Al started with the Michigan State Highway Department in 1933 as a road draftsman. It wasn't long before he was chief road draftsman.

The problems of traffic, however, began to weigh on Al's mind, and so he took a leave of absence from the Highway Department and completed a post-graduate year of study at the Yale Bureau of Highway Traffic. Returning to the Michigan Highway Department in June, 1940, with the new diploma in hand, he served as highway traffic design engineer for but two months before being appointed traffic and safety engineer. With Al in traffic, the road division apparently missed him, for two years later, in August, 1942, he was named road engineer for the Department.

By this time, others began to notice the competent young engineer who had demonstrated special abilities in both traffic and road design. The City Engineer's Office of Detroit, in 1944, employed Al as expressway engineer.

(See MALO *on page 444)*

Arnold Vey, "Cy" to his many ITE and other friends, got his start in Irvington, New Jersey. He attended high school there, sold newspapers, clerked in stores, did a bit of farming and then entered the field of transportation—driving a truck. From truck driver he became a freshman at Rutgers University.

Cy's first job "for financial gain" as he puts it, although we doubt that he drove that truck for his health, was as assistant to the supervisor of transportation in Newark from 1924 to 1927. His duties included supervision over checkers and recorders of operating data—passenger riding, traffic volume and other field studies.

While with the city of Newark, another of Mr. Vey's duties included liaison between the supervisor of transportation and the consulting engineering firm of Parsons, Klapp, Brinkerhoff and Douglass. The consulting firm, impressed with young engineer Vey, employed him to work in their New York office. His work included the usual traffic surveys, estimates of traffic over new facilities including bridges and tunnels and then complete charge of the field work for a survey of the City of Cleveland. The Cleveland survey included a thorough study of transit operations, an O-D study of all transit passengers, traffic volume studies and final recommendations including financial estimates.

In 1930 Arnold Vey became state

(See VEY *on page 444)*

REFLECTOR BUTTONS AND SIGNS

that give lasting brilliance

EVEN IN THE RAIN!

- DANGER SIGNALS
- GALVANIZED SIGN POSTS
- HIGHWAY SIGNS AND MARKERS
- STREET NAME SIGNS
- RAILROAD CROSSING SIGNS
- REFLECTOR BUTTONS

CATAPHOTE

CORPORATION,

TOLEDO, OHIO

(VEY, *Con't from page 442*)

traffic engineer for the Department of Motor Vehicles, State of New Jersey, a position which he holds today. He is responsible for all traffic engineering work for the state as well as technical advisor to the Commissioner of Motor Vehicles.

In addition to his many activities as state traffic engineer, Cy has served as:

Chairman of the New Jersey War Transportation Committee.

Executive Secretary of the New Jersey Highway Traffic Advisory Committee.

Technical assistant to the Director of Civil Defense.

Chairman, Department of Traffic, Highway Research Board.

Member, Joint Committee which produced the Manual on Uniform Traffic Control Devices.

Representative of the ITE on the Highway Standards Committee, American Standards Association.

Member, Advisory Committee, Eno Foundation.

Member of numerous ITE, National Safety Council and American Association of Motor Vehicle Administrators committees.

In November, 1942, Mr. Vey became a commissioned officer in the Transportation Corps, U. S. Army. From then until March 1945 he served first as transportation officer and then as commanding officer, District Transportation Office, U.S.A. at Detroit.

In 1945 he went overseas as Chief of the Plans and Control Division for the India-Burma Theater. Before returning to the states, with the rank of colonel, he became commanding officer of the 468th Quartermaster Truck Group.

(MALO, *Con't from page 442*)

The task, assigned to him, was the basic planning for 58 million dollars worth of urban expressways.

The City of Detroit soon found out that Al was too valuable for one department to monopolize his services, just as the State Highway Department had previously discovered, and, consequently, he moved his desk over to the Department of Street Railways to serve as design consultant in a major modernization program. Upon completing that assignment, the DSR proved hesitant in letting Al go, and appointed him safety engineer in January, 1947.

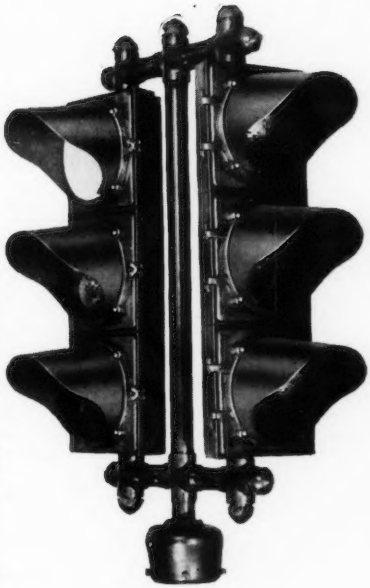
However, the DSR could not hold on to him indefinitely. When the important post of city traffic engineer was vacated, Al Malo was the logical choice to fill the gap. In his new position, he finds himself reporting directly to the Mayor, and charged with complete responsibility for all traffic engineering functions. He finds himself supervising the work of an even 100 employees. Al likes to boast that his staff includes five registered professional engineers in the State of Michigan. He is a registered engineer himself.

As a member of the *Institute of Traffic Engineers*, Al actively participates in the programs of the Michigan Section. Also, he is a member of the Michigan Engineering Society, and the Engineering Society of Detroit.

Quoting from a local newspaper in announcing his recent appointment: "Mr. Malo lives with his wife and three children."

19th Annual Meeting
INSTITUTE OF TRAFFIC ENGINEERS
Philadelphia, Oct. 11, 12 and 13, 1948

NEW!

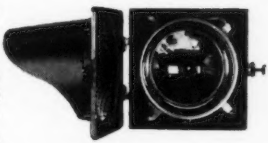


G-E adjustable traffic signals meet ITE performance specifications, have better gasketting and are more easily wired.

All G-E adjustable-type traffic signals are now being furnished in a new design.

- They have the most efficient optical system ever designed for traffic signals. A "sagged" glass reflector is used—free from whorls, striae and all other imperfections.
- The entire optical system is completely sealed to prevent dust filtering in—drastically reducing maintenance.
- The reflector remains in the housing when the door is opened for lamp replacement and casual servicing.
- Pipe crosses replace the elbows previously used. Removable ornaments facilitate wiring and permit "arrows," "walk" and "wait" signal sections to be added later.

The complete line includes one-way one-color to four or more ways with unlimited signal indications per face. New sections are interchangeable with older design. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



Cast-aluminum reflector holder, reflector, and socket remain accurately positioned and cushion-mounted in the cast-aluminum reflector holder when the door is open.

While the die-cast aluminum door is accurately gasketted to the housing, the truly dust-tight seal is formed by an extruded rubber gasket of "air-core" construction which completely envelopes the lens and, with the door closed, presses against the reflector holder.

The optical system can be swung out of the signal housing for wiring inspection or replacement by releasing two spring latches. It can be removed and replaced without tools. Color-coded Flamenol wires run to a terminal block in the top "red" or bottom "green" sections.

GENERAL ELECTRIC

453-42F

(MAINE, Con't from page 407)

variably used either intentionally or unintentionally by opponents of toll projects to influence public opinion. The argument is advanced that in case of insufficient revenue the taxpayer will be called upon to fulfill the obligation. Courts have repeatedly ruled that revenue bonds which have been issued on the basis that they were secured solely by a lien on net revenues, do not in case of default become a general obligation to be met through taxes. Public tax funds have not been used in any way for acquisition of right-of-way for construction or for maintenance and operation of the Turnpike. The Highway Commission was even reimbursed for expenditures which it had paid out in the early stages of development of the project.

> Criterion 7: "Revenues in excess of operating costs including interest shall be used exclusively to retire outstanding obligations for the toll facility for which the bonds were issued".

When the revenue bonds for the Maine Turnpike were sold the proceeds were deposited with a Trustee named in the Indenture. During construction of the project requisitions for payments to the contractors, etc. were made only upon approval of the Engineers and the Authority. On completion of construction, surplus bond funds will be transferred to a sinking fund. After opening the Turnpike to traffic all income including tolls is placed in a revenue fund. Subject to approval, annual budget withdrawals are made from the revenue fund only to cover operation costs and maintenance reserves. Operation costs include administration, toll collection, maintenance, snow removal, insurance, and other miscellaneous costs. The balance remaining in the revenue fund is then turned over to the Trustee to be placed in the sinking fund. Under the provisions of the Indenture, the Trustee must use the sinking fund exclusively for bond interest and bond retirement. Interest rates are 2½% on $15,000,000 and 2¾% on $5,000,000. The Indenture further includes covenants of the Authority, to maintain an adequate schedule of tolls, to keep the Turnpike in a properly maintained condition at all times and to retain Consulting Engineers to pass on all phases of operation and make recommendations for maintenance.

> Criterion 8: "When the outstanding obligations are realized the toll road shall become a public highway".

The Enabling Act creating the Turnpike Authority authorized the Authority to issue bonds for the cost of the Turnpike. When all the bonds are retired, the Authority will be dissolved and the Turnpike property will become the property of the State of Maine and the Turnpike operated and maintained by the Highway Commission incorporating the Turnpike in the State Highway system. The traffic engineers have estimated that the Turnpike will carry about a million and a half vehicles the first year with gradual increase to around two and three-quarters million vehicles in twenty years. Operating expenses are estimated at $160,000 to $200,000 a year. Amortization of the $20,000,000 outstanding bonds is estimated to take twenty years. In addition to revenues from tolls, the Authority will also derive income from gasoline and restaurant concessions. These are located at the midpoint of the Turnpike. The concessionaire is spending $300,000 in providing the necessary buildings. The Authority will receive a percentage on each gallon of gasoline sold and on the gross restaurant sales. Tolls on the highway are approximately 1c a mile for passenger cars with higher rates for trucks.

Thus we see every criterion set out by an opponent to toll roads has been satisfactorily answered as regards the Maine Turnpike.

The increased safety and time saving factors of the Turnpike should be self evident, a forty-seven mile drive with no curve sharper than 1 degree and all cross traffic eliminated. The distance can safely be covered in one-half the driving time required traveling on U. S. #1.

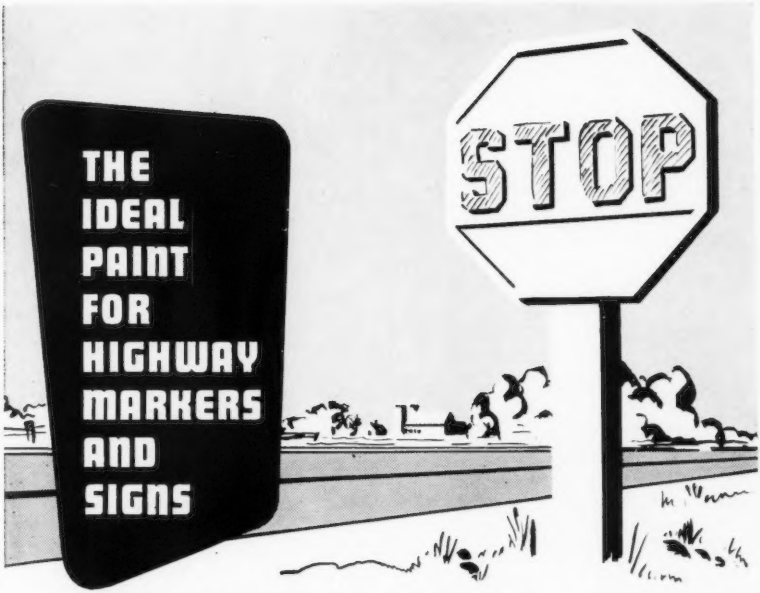
The Maine Turnpike has created a great deal of interest, not only because it is a high speed limited access road built to acceptable current modern standards but because it is more or less a guinea pig in modern toll roads. Will traffic be diverted to it? Will revenue be sufficient to meet operating costs, bond interest and bond retirement provisions of the Indenture? The highway has been in operation three and one-half months. Although the heavy traffic is expected during the summer vacation months, the revenue to date has been considered satisfactory for the winter months during which it has operated.

The first section of the Maine Turnpike parallels U. S. #1 for about 47 miles; one road is free, on the other a toll is collected. The choice of the road to follow is optional with the motorist. If the motorist chooses to ride the Turnpike to the extent that revenues therefrom will be sufficient to amortize the bonds issued for its construction within the period of 20 years, the proof should be conclusive that the traveling public wants modern safe limited access highways. Further, the public is willing to pay a toll in order that these roads can be available as quickly as possible and not some time in the distant future when taxes can be collected to pay for them.

Toll roads should only be constructed as such if they comply with the criteria established in the policy of the AAA. There are more locations where toll roads should not be built than where they could possibly be economically justified. Traffic volume establishes the desirable locations, for which traffic volume exists, there is generally congestion and immediate need for relief. If funds cannot be provided for a "free" road, the toll road may be the answer. It appears to have been the answer in the case of the Maine Turnpike.

NEW CONTROLLER

The Marbelite Company has developed an exceedingly simple universal traffic signal controller that is adaptable to both low and high volume intersections. Called the "M" series, the controller is designed for ease of service and can be used for 16 signal circuits.



NAZ-DAR *Weatherproof* SILK SCREEN ENAMEL

BY ACTUAL TESTS, a number of states have found NAZ-DAR Silk Screen Enamel FAR SUPERIOR to any other, and are using it with great satisfaction.

IT STANDS THE GAFF! Withstands exposure for indefinite periods . . . dries with a hard and tough surface with a fine glossy finish. Comes in paste form . . . 1 gallon will cover from 900 to 1200 sq. ft.

HEADQUARTERS FOR ALL SILK SCREEN SUPPLIES — colors, silk squeegees, stencil knives, etc.

WEATHER PROOF

Write for full information and prices.

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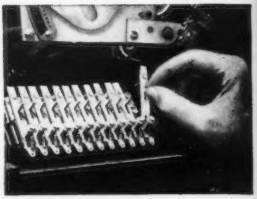
SERVICE FEATURES OF THE NEW MARBELITE CONTROLLER

Self Locking Dial Keys . . .

Just open the dial door and insert the key. Once positioned, it locks in place. To remove, simply press the key towards the center of the dial, and out it comes. No retainer ring or holding device required. And for quick identification, the key handles are color coded; black and yellow for signal intervals; red, white and blue for 1st, 2nd and 3rd offsets, used in an interconnected system.

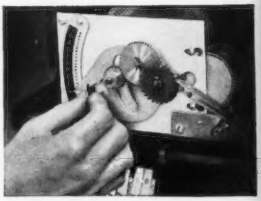
Quick as a wink, replace a contact finger . . .



Simply grip the contact finger handle and slide out from the holder spring. Quick as that. And replace in the same easy way.

Also remember that carbon or oxide particles will not accumulate under the movable contacts. But will fall through the gap, provided by the separate contact blocks, to the bottom of the timer.

To Change the Timing Cycle simply . . .



Replace the numbered timing gear, and set the indicator on the corresponding dial speed. Automatically, the gears will be meshed on proper working centers. And the non-coasting, synchronous motor will maintain this speed —because it runs always in step, never out of synchronization.

Write for our new Bulletin M-10 which describes in detail this new controller with the trouble-free cam mechanism and noiseless solenoid.

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